TMENT OF
ND ERIE COU BLIC LIBR

OCTOBER 12, 1957
VOL. 153—NO. 15

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

PLANNING FARM WORK

Coordinating farm work is made easy with the telephone. The Smith Brothers, whose adjoining farms are served by United Telephone Co. of Pennsylvania, plan the day's work from their barns after they hear radio weather reports. Here Charles Smith calls his brother.

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

PHILCO TLR-6

Provides Maximum System Reliability

Philco TLR-6 microwave provides economical transmission of NTSC compatible color or monochrome TV signals . . . plus full audio channel. Here is a completely modern microwave system . . . especially designed to meet the needs of community TV operators for thoroughly dependable operation.

TLR-6 delivers 1 full watt output. Heavy duty power supply insures outstanding operational reliability in continuous unattended service.

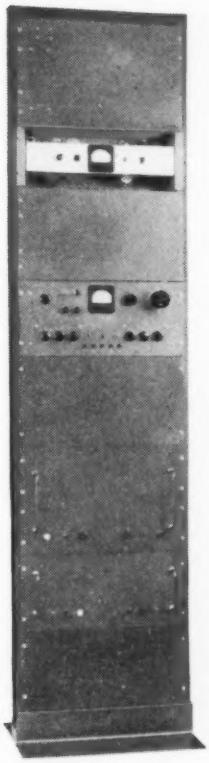
Philco TLR-6 provides S-T-L relaying in the 5900 to 7400 mc bands. All components mount in standard 19″ racks. Unitized circuit construction simplifies maintenance. Built-in test and metering circuits in the new TLR-6 equipment assure uninterrupted service at all times.

Here is reliability of performance unaffected by severe weather, free from the many limitations of wire and pole lines, unhampered by problems of difficult terrain, over-water transmission or expensive rights-of-way.

Philco engineers will be happy to help you with your special Microwave requirements. Please contact us for further information. Look ahead . . . and you'll choose Philco.

MICROWAVE

for Unattended TV Relaying!



- **Highly *reliable*, unattended one-watt operation**
- **Field proven in extended multi-hop applications**
- ***True* repeater permits top quality, long haul operation**
- **Highest power in the industry**
- **Full voice channel multiplexing**
- **Philco offers complete turnkey service . . . surveys . . . installation . . . maintenance**

Write for Specification Sheet which describes the new Philco TLR-6 microwave system.

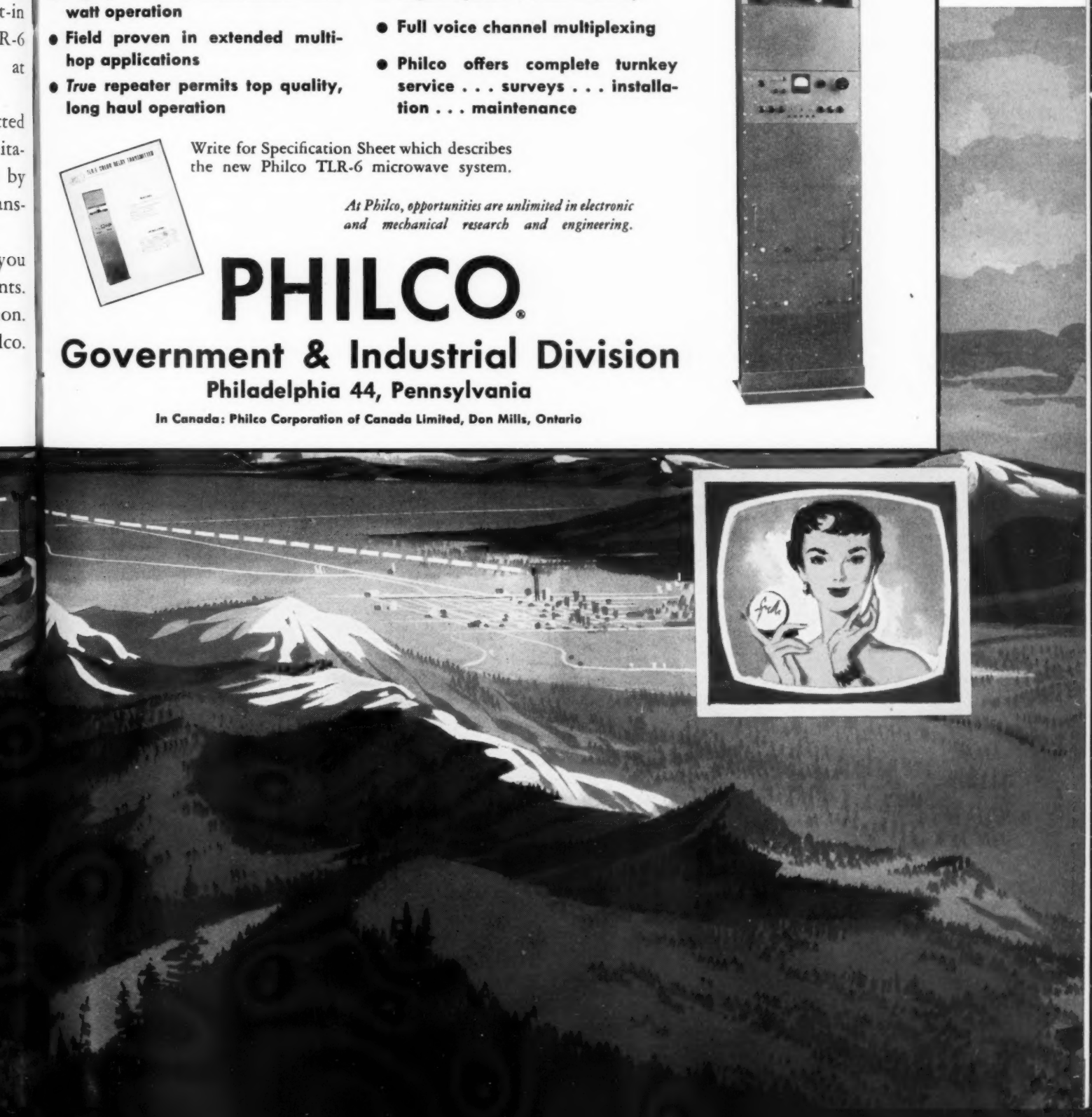
At Philco, opportunities are unlimited in electronic and mechanical research and engineering.

PHILCO®

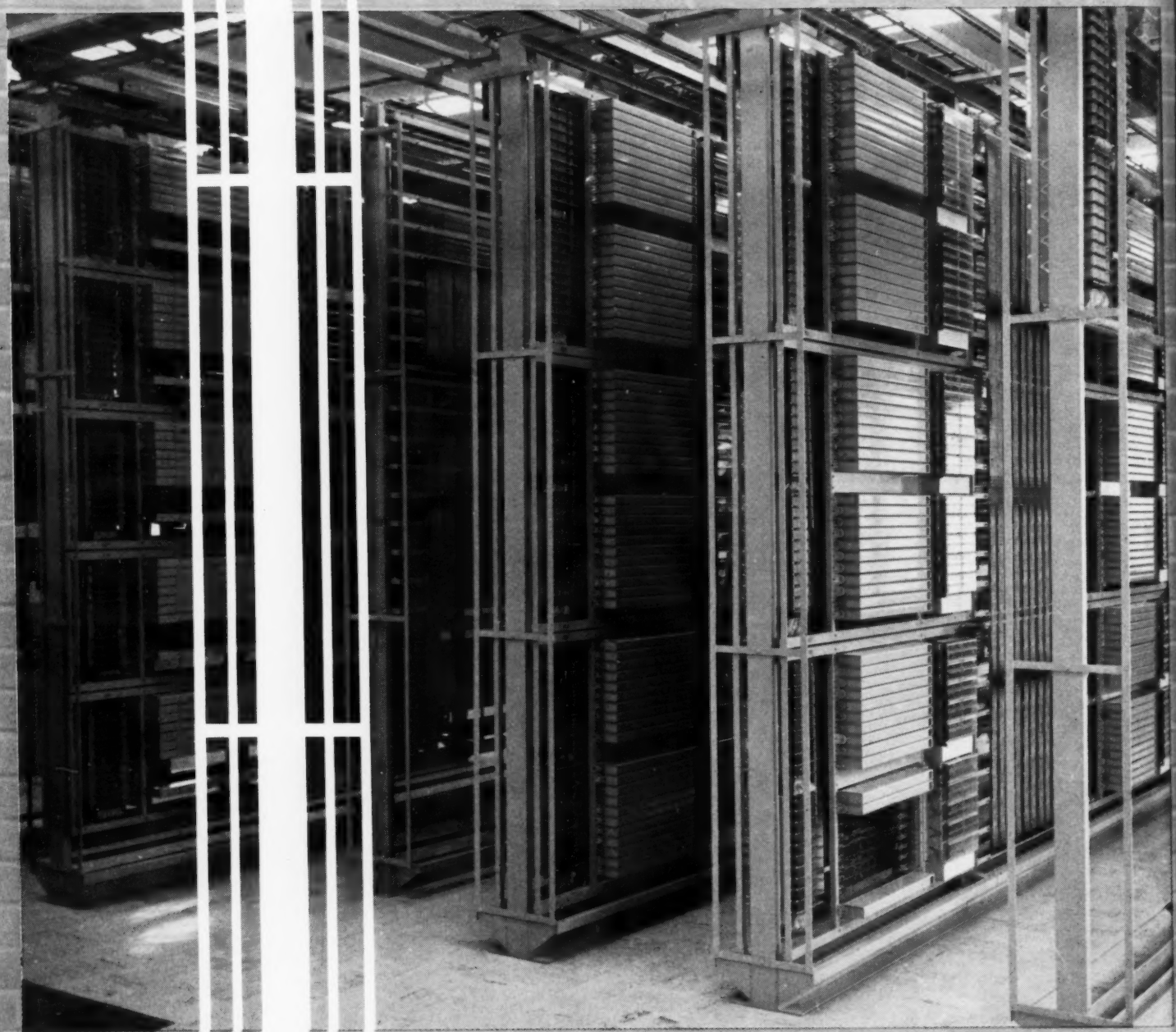
Government & Industrial Division

Philadelphia 44, Pennsylvania

In Canada: Philco Corporation of Canada Limited, Don Mills, Ontario



How you can save on building cost



st with XY® Dial switching equipment

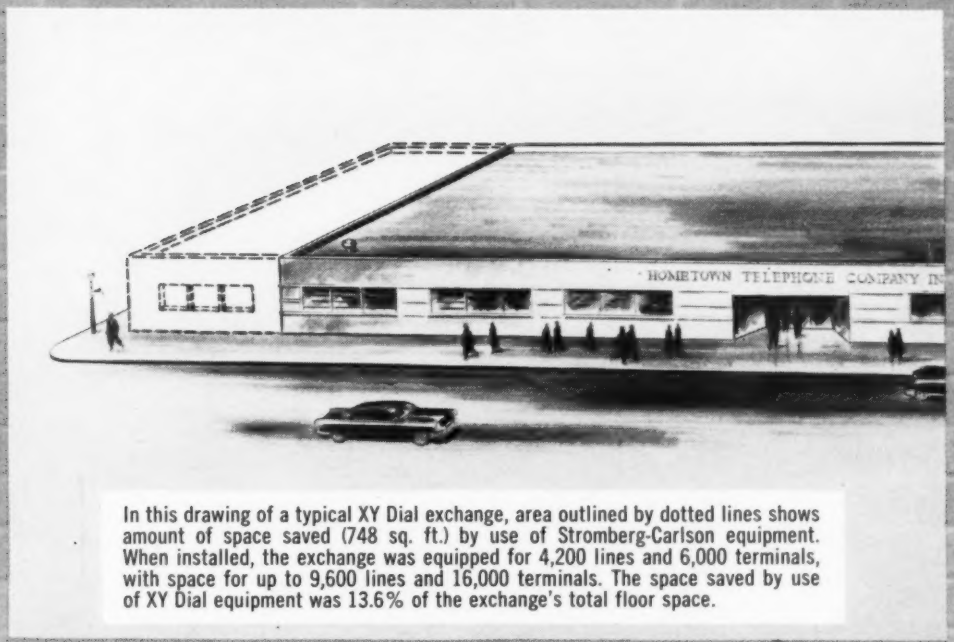
WHEN you invest in new central office facilities, a large part of your outlay goes into the *building itself.*

With construction costs skyrocketing, you'll welcome the substantial savings you get with Stromberg-Carlson equipment because it saves a great deal of space. It saves space *because it is double-sided:* switches and associated circuit plates are mounted on *both sides* of the equipment bay frames.

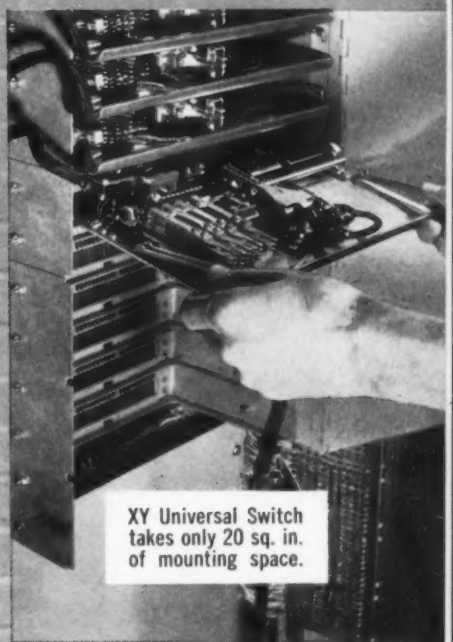
The drawing below shows the actual amount of floor space saved—748 square feet—in a typical XY Dial switching installation.

Other important features of the XY Dial System are: vertical multiple wire banks that need no cleaning or oiling; *welded twin contacts* —22.7 times as reliable as single contacts; the XY Universal Switch that works as a line finder, selector or connector; 100% access to toll; the "Fourth Wire" which performs many extra jobs; wipers that never need changing.

To get the complete XY story, ask your Stromberg-Carlson representative for Booklet T-2003, which describes XY Dial Systems.



In this drawing of a typical XY Dial exchange, area outlined by dotted lines shows amount of space saved (748 sq. ft.) by use of Stromberg-Carlson equipment. When installed, the exchange was equipped for 4,200 lines and 6,000 terminals, with space for up to 9,600 lines and 16,000 terminals. The space saved by use of XY Dial equipment was 13.6% of the exchange's total floor space.



XY Universal Switch takes only 20 sq. in. of mounting space.

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

XUM

If we put a midget operator

in the control box –

If you put a midget operator in the control box of your key system you might be able to match the service you get from your K1A1 system. But you would have a busy midget. Here are a few of the things she would have to do, and do efficiently and tirelessly.

She would have to handle up to 4 incoming lines. The K1A1 selects as many as 4 central office or PBX lines.

She would have to give intercommunication service. The K1A1 permits you to select any one of eight other key phones simply by dialing one digit.

She would have to hold calls. With the K1A1 you can hold one call while talking on another line. This permits every key telephone user complete operational control.

She would have to flash the illuminated buttons. With the K1A1, buttons flash on incoming calls and burn steadily when the handset is lifted . . . this prevents accidental interference by other users.

These are the features your subscribers get with the compact and easily operated K1A1 system. No wonder the 1A1 type system is the fastest selling key system in the country. You will find that the K1A1 is a truly profitable revenue producer. It is easy to install and it requires practically no maintenance.

KELLOGG
A DIVISION OF I T & T

KELLOGG SWITCHBOARD & SUPPLY COMPANY
A Division of International Telephone and Telegraph Corporation
6650 S. Cicero Ave., Chicago 38, Ill.

KELLOGG Branch Warehouses and Offices:

5924 S. Pulaski Road
Chicago 29, Illinois
REliance 5-7740

4501 Truman Road
Kansas City 1, Missouri
Humboldt 7085

410 N. Syndicate Ave.
St. Paul 4, Minnesota
Midway 6-7908

504 County Bank and Trust Bldg.
Passaic, New Jersey
Prescott 9-3610

1515 Turtle Creek Blvd.
Dallas 7, Texas
Riverside 7-5191

23 Broderick Road
Burlingame, California
OXford 7-5780

1555 West Fourth Street
Mansfield, Ohio
LAfayette 4-6511

1594 Southland Circle, N.W.
Atlanta, Georgia
Sycamore 4-2441

Export Distributor:
International Standard Electric Corp.
50 Church Street
New York 7, New York

XUM

FLASHES AND PLUGS

FOUR DOLL MYSTERY. Philadelphia police were wondering recently if the mystery of four dolls might be connected with the four dolls (telephone operators) who rent rooms in the home of a local resident, reports the *Associated Press.*

The landlord answered the door bell before dawn the other day and found a lightweight parcel resting on top of his mail box. He shook it, heard nothing and decided to play safe. He telephoned police who in turn called in the nearest Army ordnance unit. Inside the package, ordnance men found four pretty dolls neatly wrapped in tissue paper.

The head of the household was at a loss to know who would send him such an unusual gift. Then he remembered his tenants, the four pretty telephone operators. But they were equally mystified.

Still, four dolls and four pretty girls? Police wondered.

•

VANITY IN THE COMPOSING ROOM. The society editor of a Memphis newspaper was in the composing room recently directing the "make-up" when a man tried to get her on the telephone.

"She's probably in the make-up room," the caller was told.

There was a moment of silence before the man blurted out: "That's the trouble with these women. They spend too much time in the make-up room."

•

SARCASM BACKFIRES. A housewife in Ontario recently took a wry satisfaction in inserting the following advertisement:

"Would the person who cut down my plastic clothes-line and also my clothes prop kindly call back and I will give them the clothespins?"

Now she wishes she hadn't, saying: "My telephone has been ringing ever since. Everyone wants to come for the clothespins."

•

LULL BEFORE THE STORM. "When a woman suffers in silence," says *The Saturday Evening Post*, "it means that her telephone is temporarily out of order."

•

QUERY FROM THE FRONT. Seems there was this nervous lineman whose wife and mother-in-law both were telling him how to drive from the back seat.

So he said to his wife, "Say, who's driving this car—you, or your mother?"

CHANGE OF ADDRESS

Please notify your local postmaster and the Circulation Dept. of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

October 12, 1957

CONTENTS

ATTENTION SMALL COMPANIES! HERE'S A SERIES OF ARTICLES JUST FOR YOU 19

IN THE NATION'S CAPITAL 21
By Francis X. Welch

DESIGN AND OPERATION OF SMALL COMPANIES—Part I 23
By R. J. Pollock

THE SUPERVISOR—VITAL LINK IN MANAGEMENT CHAIN 26
By Gilbert R. Brackett

THE PLANT MAN'S NOTEBOOK 29
By Ray Blain

TELEPHONY'S TRAFFIC ENGINEERING HANDBOOK 30
By Gilbert R. Brackett

COURTS AND COMMISSIONS 37

SOUTHERN TECH ESTABLISHES ITS TELEPHONE TECHNOLOGY COURSE 54
By R. N. Edwards

AMERICAN BUSINESSMEN SHOULD CULTIVATE THE ART OF LISTENING 60

H. D. FARGO JR., *President and Director of Advertising* • A. J. STULTS, *Vice President and Advertising Manager* • R. C. RENO, *Vice President and Editor* • DAN S. FARGO, *Vice President and Managing Editor* • FRANCES E. CRETCHER, *Associate Editor* • FRANCIS X. WELCH, *Washington Editor* • RAY BLAIN, *Technical Editorial Director* • HAROLD B. McKAY, *Electronics Editor* • MAYME WORKMAN, *Traffic Editor* • VIVIAN RYDEN, *Circulation Manager.*

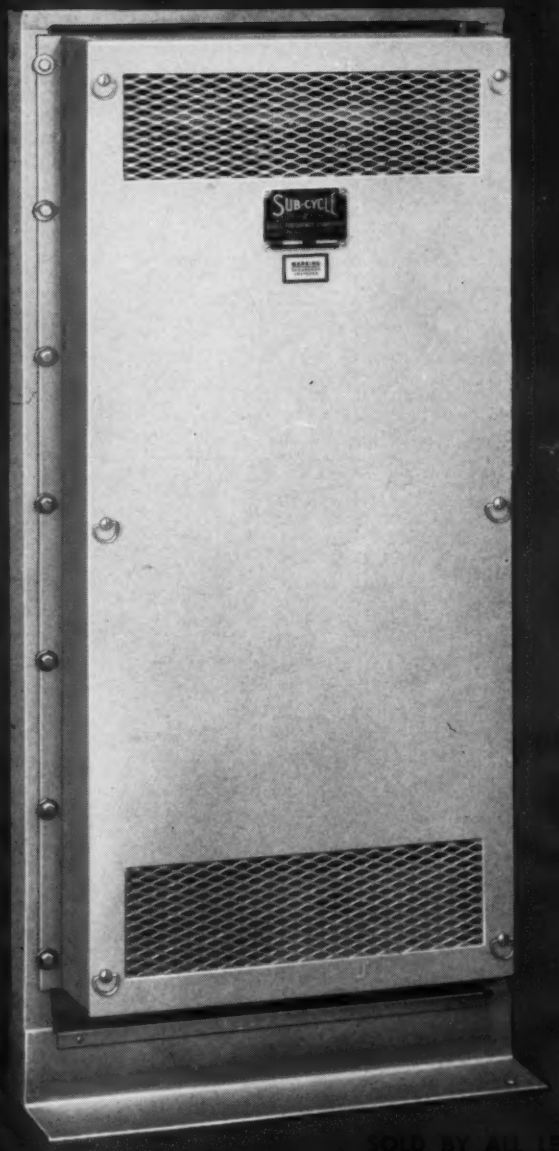
VAC VERIFIED AUDIT CIRCULATION

Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879. 25c per copy (except special issues—40c). Subscription $4.00. 1-year; $6.50, 2-years; $8.50, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone WAbash 2-2435.

another **FIRST** by Lorain!

THE S-5 SUB-CYCLE

FOR SYNCHROMONIC RINGING!



PERMANENT

Dependable

OPERATION!

YEAR AFTER YEAR

Making use of a unique conversion principle combined with basic Sub-Cycle circuits used repeatedly in other Lorain equipment, the S-5 Sub-Cycle has power to spare. Depend upon it to deliver full-rated capacity even under the most gruelling conditions. It has excellent voltage regulation, and will always deliver the exact synchromonic ringing frequencies. The S-5 has no moving parts; therefore, it provides the permanent, maintenance-free, economical operation that is characteristic of all Sub-Cycles.

The Model S-5 can be equipped to supply either 15 cycles or 20 cycles as the fifth frequency; if only four frequencies are required, the converter is designated as a Model S-4. A minimum of floor space, only 24-3/8" by 15", is required.

WRITE FOR BULLETIN 169

SOLD BY ALL LEADING TELEPHONE DISTRIBUTORS

LORAIN PRODUCTS CORPORATION · LORAIN, OHIO

FLOTROL
PARTNERS IN DEPENDABILITY
SUB-CYCLE

Here's a real PABX PACKAGE

LEICH'S NEW 40A PABX

Uses standard Leich telephones

Attendant's cabinet smaller than a typewriter

Here's a new PABX package that you and your customers can really get excited about. It offers better PABX service, greater traffic capacity, faster extension of calls, and a variety of service features.

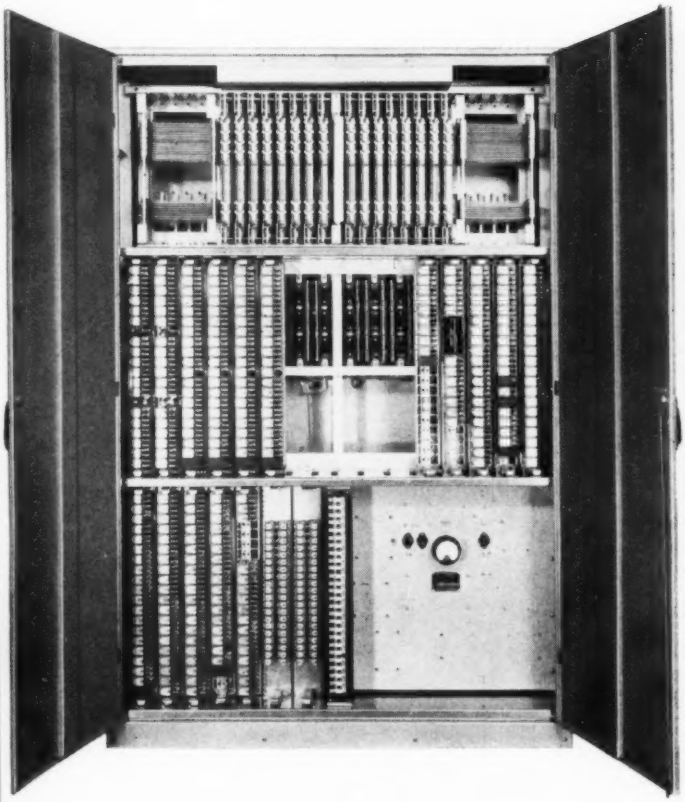
The new Leich 40A PABX is designed after the famous Leich Dial System. It offers dependable all-relay switching in a modern, compact cabinet which will fit in any modern office or plant. It offers a new exclusive attendant's cabinet which extends calls quickly by key pulsing the called number. It uses regular telephone instruments.

This Leich PABX is available for up to 40 telephones with 10 trunks to the main exchange and 6 local links. Local links are not tied up on extension dialed calls to city trunks. All the power equipment is contained in the compact switchboard cabinet.

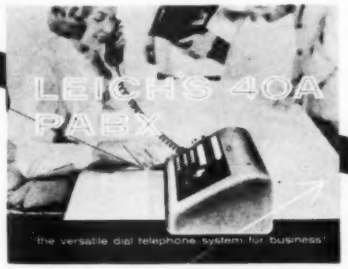
Write for this new catalogue. It describes all the features of this versatile new PABX. It is written in a way that will explain this service to your customers. Write for it today.

LEICH

A MEMBER OF THE GENERAL TELEPHONE SYSTEM — ONE OF AMERICA'S GR COMMUNICATIONS SYS



Dependable, compact Leich Dial Switchboard



Here Are Some of the Features Your Customers Will Like

A. Any inside station may call outside without waiting for attendant.

B. Restriction of outside calls if desired.

C. Consultation calls without help from attendant.

D. Quick extension of outside calls to any required telephone.

E. Night answering by any telephone.

F. Inside telephones have two digit numbers.

LEICH SALES CORPORATION, 427 WEST RANDOLPH STREET, CHICAGO 6, ILLINOIS

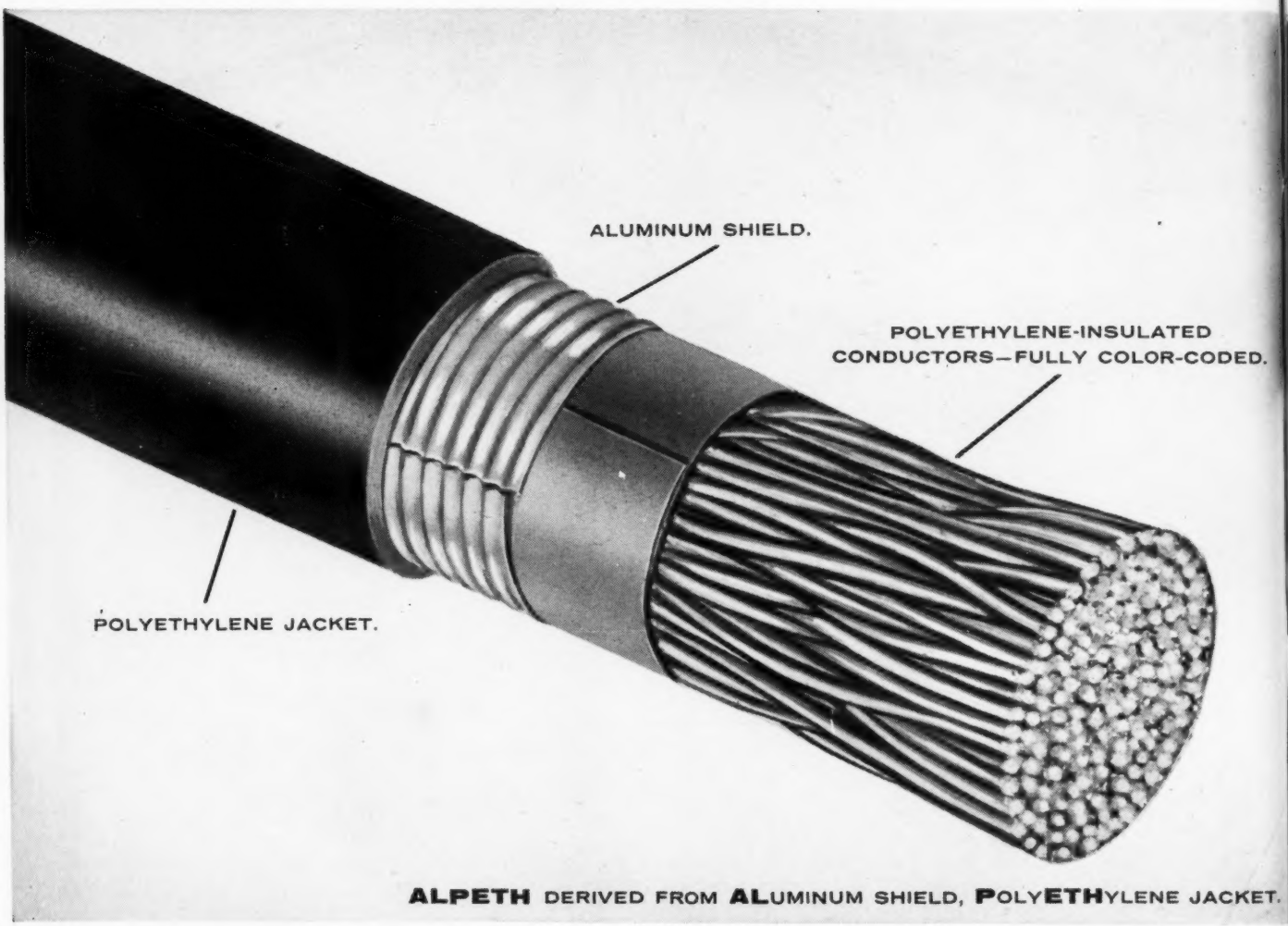
PACIFIC COAST: 11401 WEST PICO BLVD., LOS ANGELES 64, CALIFORNIA SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS

manufacturers of telephones, switchboards and related apparatus since 1907

ANACONDA ANNOUNCES

ALPETH Cable . . .

with plastic-insulated conductors



ALPETH DERIVED FROM **AL**UMINUM SHIELD, **POLY ETH**YLENE JACKET.

This cable features a true low-resistance shield, full color code...and all pairs are guaranteed!

- Polyethylene insulated conductors—provide excellent electrical properties and high moisture resistance.
- Full color coding—means quick identification, speeds up splicing and terminating. All pairs guaranteed.
- Aluminum shield, longitudinally applied—offers low resistance, corrugated for flexibility.
- High-molecular-weight polyethylene jacket—gives mechanical protection, and high moisture- and corrosion-resistance.

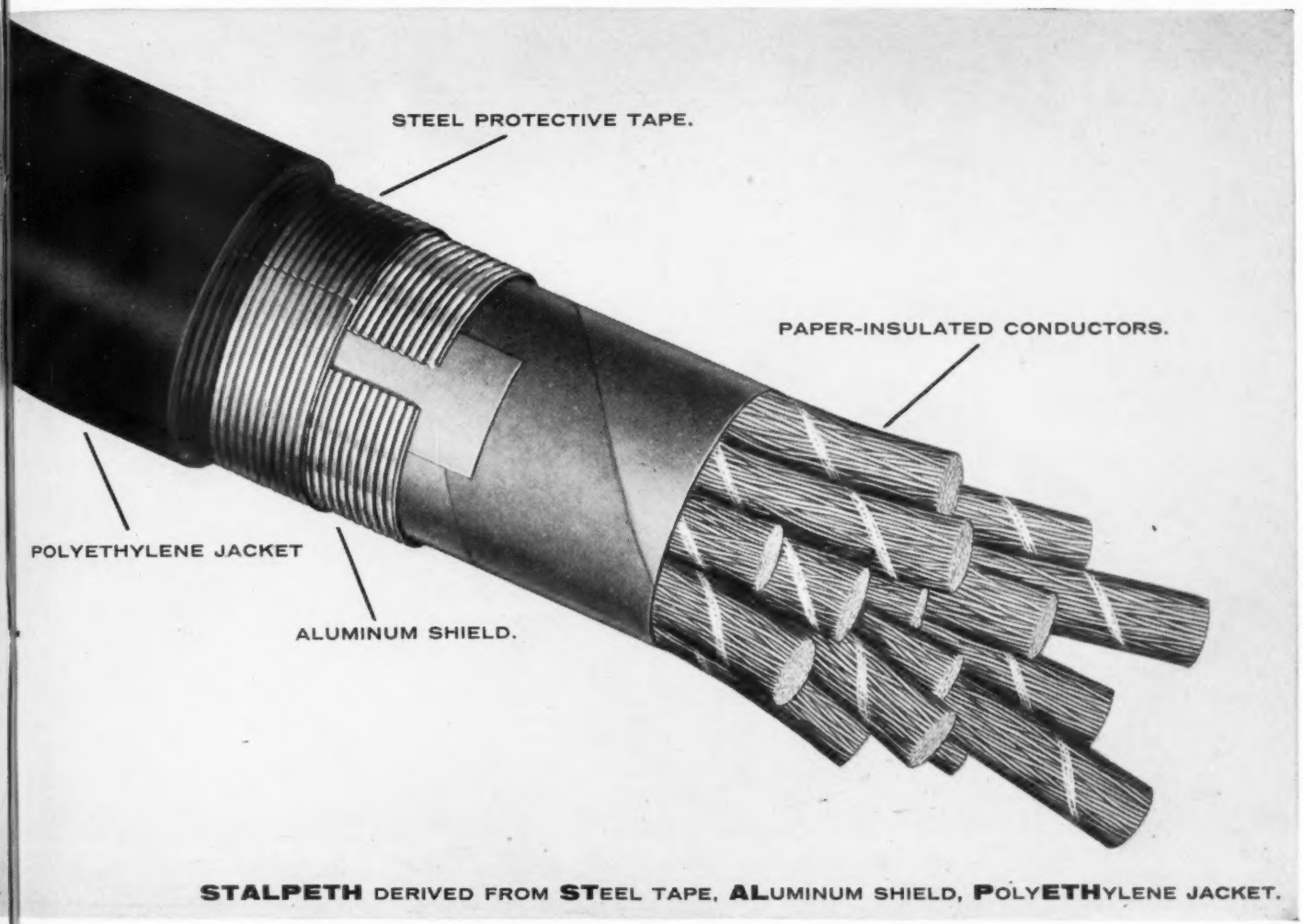
Alpeth, Stalpeth: manufactured under patent license agreement with the Western Electric Company, Inc.

UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION

SEE THE MAN FROM ANACONDA®

STALPETH Cable

with paper-insulated conductors



STALPETH DERIVED FROM **ST**EEL TAPE, **AL**UMINUM SHIELD, **P**OLY**ETH**YLENE JACKET.

This cable gives you traditional paper quality— with economical, light-weight sheath!

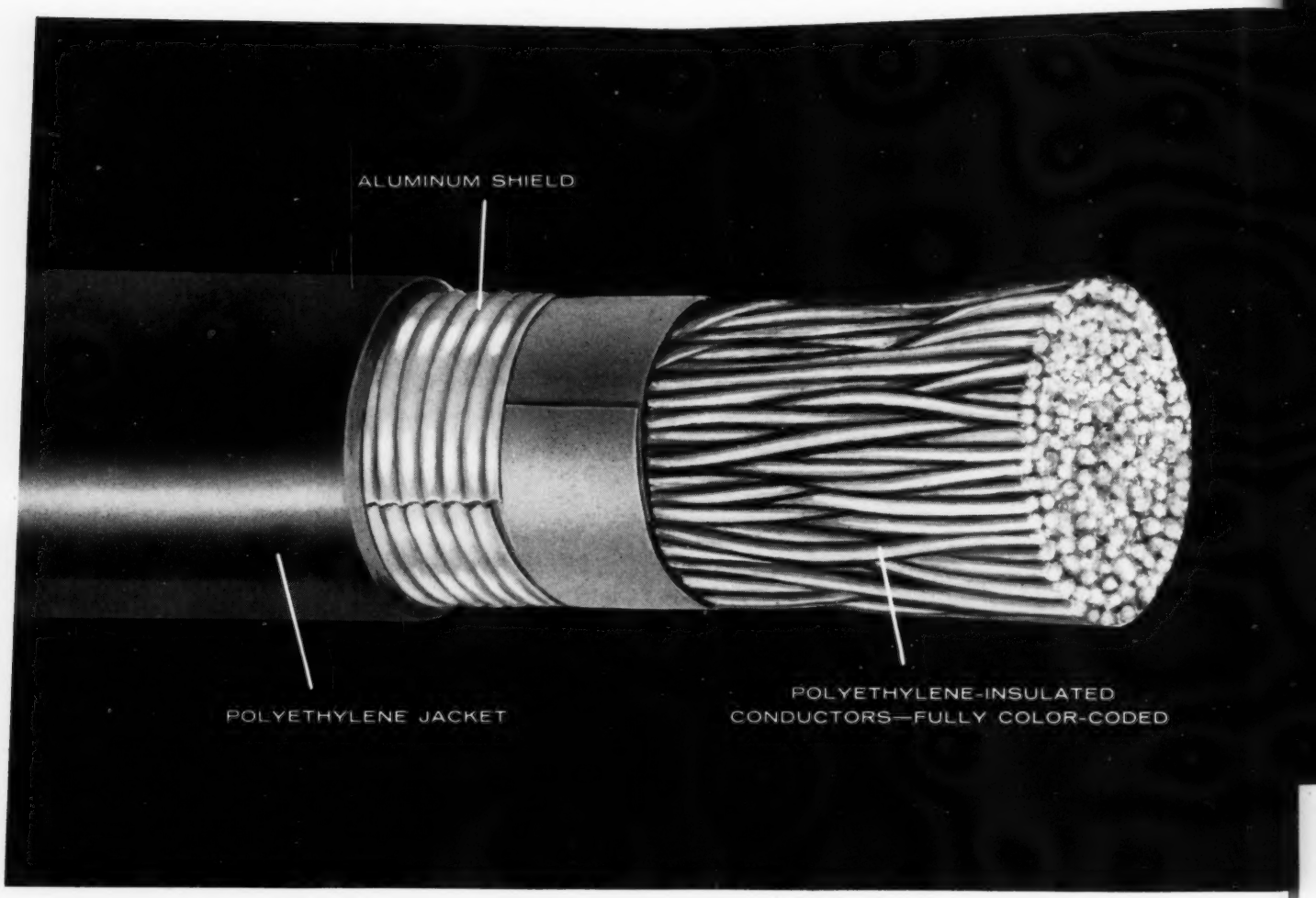
- Paper insulated conductors – offer transmission efficiency and proven reliability.
- Aluminum tape, longitudinally applied–provides low resistance, corrugated for flexibility, in larger diameter cables.
- Coated steel tape, longitudinally applied, soldered at overlap – insures watertight casing, corrugated for flexibility.
- High-molecular-weight polyethylene jacket – gives mechanical protection, and high moisture- and corrosion-resistance.

57335

Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

FOR ALPETH AND STALPETH TELEPHONE CABLE

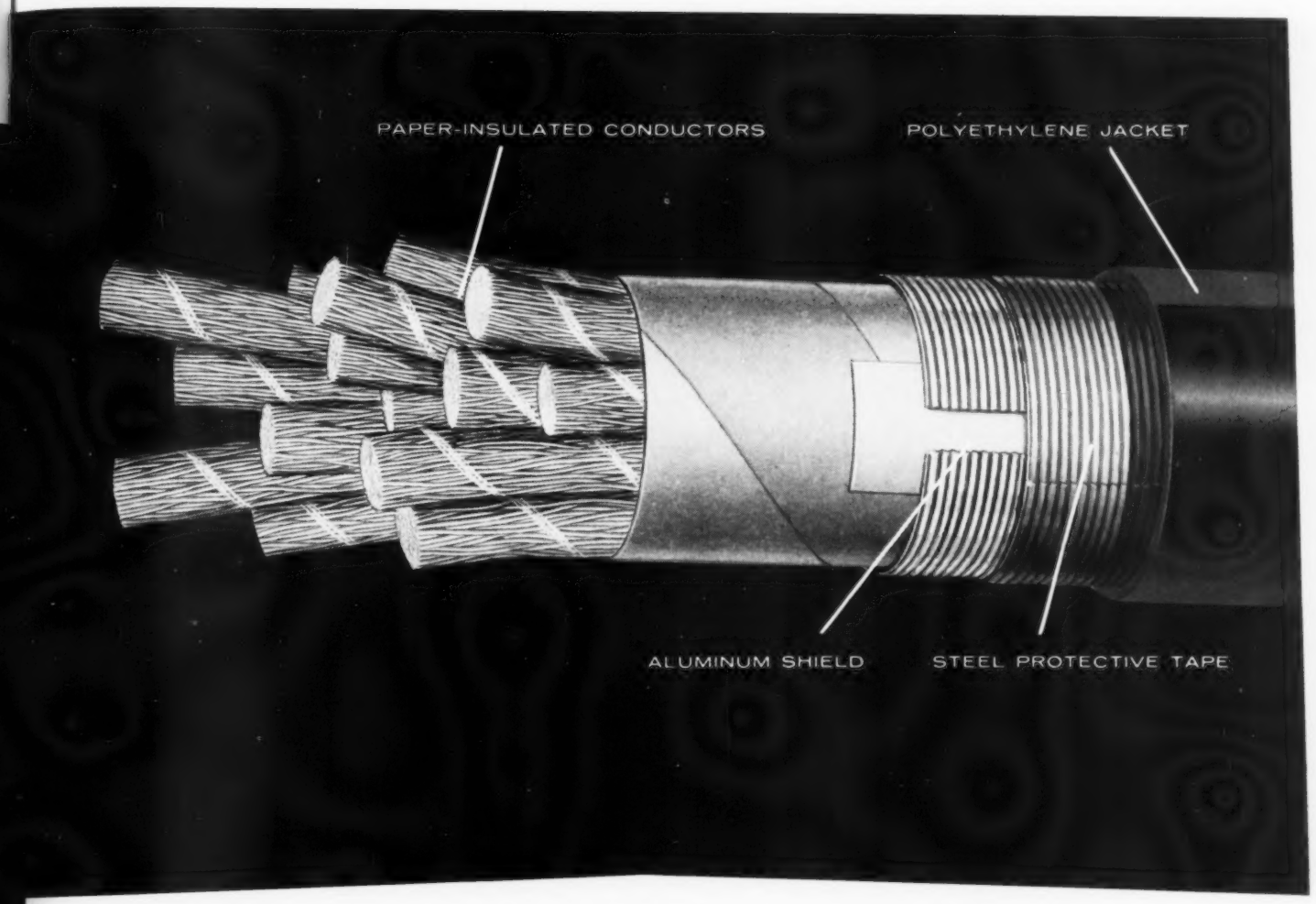
ALPETH DERIVED FROM **AL**UMINUM SHIELD, **P**OLY**ETH**YLENE JACKET.



NOW...FROM

ANACONDA ALPETH and
for the Independent Operating Companie

These cables, manufactured by ANACONDA under patent license agreement with the Western Electric Company, Inc., are now distributed to the Independent Telephone Companies through North's five conveniently located warehouses.



STALPETH DERIVED FROM **ST**EEL TAPE. **AL**UMINUM SHIELD, **P**OLY**ETH**YLENE JACKET.

NORTH !

STALPETH CABLES

. from an Independent Distributor . . .

For all types of cable and wire, pole line hardware, accessories and tools, call—

NORTH ELECTRIC COMPANY

601 SOUTH MARKET STREET • GALION, OHIO

XUM

dead-ends tailored for jacketed conductors

Preformed Dead-Ends grip firmly, yet jacketing material won't creep

There is only one way to efficiently dead-end self-supporting cable, C-rural wire and B-rural messenger: Apply Preformed Dead-Ends over the jacket.

Preformed Dead-Ends are precisely designed and fabricated to hold firmly, but low unit pressure prevents undue creepage or cold flow. In addition, for many applications they have a neoprene coating that cushions the grip yet relieves and distributes stresses.

Preformed Dead-Ends will hold the maximum service loads of the conductor or messenger without damaging the jacket. When the jacket is weatherproofing, as on B-rural messenger, you get full protection by not exposing the conductor to the elements at any point.

For more information about dead-ending weatherproofed and insulated conductor and messenger, write PREFORMED LINE PRODUCTS COMPANY, 5349 St. Clair Avenue, Cleveland 3, Ohio. Cable Address: Preformed-Cleveland . . . in 10 years the leading manufacturer of armor rods, dead-ends, Guy-Grip dead-ends, and other line accessories.

PLP

You can look up to **Preformed**

Made in accordance with or for use under U. S. Patent No. 2,761,273. Other patents issued and pending.

Shown at Bell Laboratories, Murray Hill, N. J., are, left to right, F. J. Herr, S. T. Brewer, L. R. Snoke, E. E. Zajac and F. W. Kinsman.

They're wiring the seas for sound

These five Bell Labs scientists and engineers may never "go down to the sea in ships." Yet, they're part of one of the most exciting sea adventures of modern times. Along with many other specialists, they are developing the deep-sea telephone cable systems of the future.

Here's how they join many phases of communications science and engineering—to bring people who are oceans apart within speaking distance.

F. J. Herr, M.S., Stevens Institute, is concerned with systems design and analysis. He studies the feasibility of new approaches and carries out analysis programs to select optimum parameters for a proposed system design.

S. T. Brewer, M.S. in E.E., Purdue, communications and electronics engineer, explores new designs for sea-bottom amplifiers needed to step up power of hundreds of simultaneous telephone conversations.

L. R. Snoke, B.S. in Forestry, Penn State, is the team biologist. He investigates the resistance of materials to chemical and microbiological attack in sea water. Materials are evaluated both in the laboratory and in the ocean.

E. E. Zajac, Ph.D. in Engineering Mechanics, Stanford, is a mathematician. He studies the kinematics of cable laying and recovery. Cable's dynamic characteristics, ship's motion, the mountains and valleys in the ocean bottom—all must be taken into account.

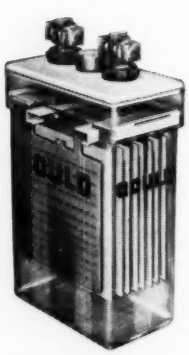
F. W. Kinsman, Ph.D. in Engineering, Cornell, solves the shipboard problems of storage, handling and "overboarding" of cable. New machinery for laying cable is being developed.

Deep-sea cables once were limited to transmitting telegraph signals. Bell Labs research gave the long underseas cable a voice. New research and development at the Labs will make this voice even more useful.

BELL TELEPHONE LABORATORIES

WORLD CENTER OF COMMUNICATIONS RESEARCH AND DEVELOPMENT

For Full Power when it's needed most, specify **gould** batteries...



America's Finest!
GOULD PLANTÉ
The Aristocrat of
Stationary Batteries

Here's why: You know that an overload can cause an unusual drain on your batteries. At such times your batteries must be in "good health" or they may not survive the strain. Keeping batteries in "good health" is not difficult, all it takes are good routine checking procedures which give you a day-by-day record of a battery's condition. By consulting these records frequently you can always be sure of full power when it's needed.

An important part of the Gould service is to help you establish such a sound preventive maintenance program, and teach your battery maintenance personnel the importance of following recommended procedures. This is another reason why it pays you to specify Gould. Want more reasons? Write for booklet "... so you're going to buy an industrial battery." Gould-National Batteries, Inc., Trenton 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

More Power to you from Gould

© 1957 Gould-National Batteries, Inc.

R. J. POLLOCK

Attention Small Companies!

Here's a Series of Articles Just for *YOU*

WITH this issue, TELEPHONY begins publication of a series of articles entitled "Design and Operation of the Small Telephone Company," especially written for smaller Independent telephone companies by R. J. Pollock.

The articles are all-inclusive and will discuss the various phases involved in managing, operating, rebuilding and maintaining a small company. Mr. Pollock has had a long and varied career in the telephone business, during which he has assisted and advised smaller companies in the state of Wisconsin. His articles are based upon his experiences in helping these companies and will cover the phases of operation which he has found have troubled owners and managers of smaller companies.

Mr. Pollock has presented an outline of the subjects he will discuss in his articles, with a brief explanation of each subject. Following is this outline and explanation of the subjects in Mr. Pollock's own words:

"The operation of a large telephone company is usually handled by an organization consisting of management in various forms, supplemented by commercial, engineering, plant and traffic departments. In the smaller companies, however, the majority of these functions are handled by one person, or only a few persons, who have an over-all working knowledge of the principles of good telephony. But, in many cases, they have never been faced with a major rehabilitation of their plants and they find themselves in need of assistance in such an undertaking.

"While much information has been published on the operation of small companies, there are many procedures that have not been covered and the articles entitled 'Design and Operation of the Small Telephone Company,' will endeavor to cover the major points which will be encountered in the rebuilding of an exchange along with the operation of it. (The third section of the outline below can be used as a guide in the event there is a question as to whether or not a rebuilding program is desirable from an operating standpoint.) Following are the subjects to be covered with a brief explanation for each subject:

"A. *The Service Area:*

(1) Potential Service Possibilities.
(2) Planning Location of Facilities.
(3) Accounting Practices.
(4) Estimated Cost of Serving Area.
(5) Financing of Project.

"B. *Construction:*

(1) Selection of the Building Site.
(2) Building Planning.
(3) Central Office Equipment.
(4) Urban Plant Design.
(5) Rural Plant Design.

"C. *Operation:*

(1) Public Relations.
(2) Maintenance of Company Records.
(3) Rate Picture.
(4) Training Company Personnel.
(5) Maintenance of Property.
(6) Sales Programs.

"It should be noted that some functions, such as commercial and engineering, do not appear in the outline. The reason for these omissions is that they are an integral part of the complete picture and will be treated as they pertain to each problem being considered. Brief summaries of discussions to be given under each of the above outlined subjects follow:

"A. *The Service Area.* Under this heading it is proposed to consider the steps necessary to set up fundamental plans to supply not only the existing customers with adequate telephone service, but also future service demand.

"(1) *Potential Service Possibilities.* In order to design a plant which will eliminate service requests which cannot be filled, it is necessary that the service area be canvassed so that all possible conditions have been covered.

"(2) *Planning Location of Facilities.* The location of facilities to meet both the present and future serv-

ice demand should be planned to reflect the most economical method so as to reduce original plant investment to a minimum and, at the same time, keep operating costs within acceptable limits.

"(3) *Accounting Practices.* Suitable accounting methods should be set up to reflect the investment as a whole along with the component parts as they pertain both to original cost and operation.

"(4) *Estimated Cost of Serving Area.* If the steps set forth above in this outline have been carried out on a *Positive Thinking* basis, it is now possible to prepare an engineering study to ascertain the estimated cost of the project.

"(5) *Financing of Project.* Many worth while projects are dropped at this stage because of the lack of necessary funds. There are various sources of new capital for small companies which have not been explored by many companies.

"B. *Construction.* If the results of the above studies are favorable and the necessary new capital is available, the engineering can be carried out in detail for the construction of the proposed plant.

"(1) *Selection of the Building Site.* The location and size of the land for the central office building should not be decided until all factors pertaining to the future operation of the company, over a period of years, have been fully analyzed and studied.

"(2) *Building Planning.* The size and type of construction of the central office building should be such that it will fulfill all requirements of sound operation and will reflect favorable consideration of the customers and their service requirements.

"(3) *Central Office Equipment.* The type of central office equipment should be determined by the operating costs and the kind of service desired by the customers, even though the original cost may seem to be high.

"(4) *Urban Plant Design.* The design of this part of the telephone plant determines whether or not it will be a good operating telephone exchange.

"(5) *Rural Plant Design.* The return on the investment in rural facilities can be increased to its full potential by selling rural subscribers on the full value and convenience of telephone service instead of just selling them party line telephones and letting it go at that.

"C. *Operation.* The success of any small company depends upon its operating practices.

"(1) *Public Relations.* Favorable customer reaction results not only from giving good service, but from the effort put forth to educate the public as to the meaning of the term.

"(2) *Maintenance of Company Records.* Records to a telephone company can be compared to a rudder on a ship and small companies must establish and keep adequate records so as to reflect the status of their operations at all times.

"(3) *Rate Picture.* Rates should be adequate to cover the cost of furnishing good telephone service and to permit a fair return on the company's investment and there should be an educational program aimed at securing the public's acceptance of such rates.

"(4) *Training Company Personnel.* Employes must not only be trained to do their jobs well, but they should be taught and encouraged to reflect the company favorably in their contacts with the public.

"(5) *Maintenance of Property.* Good maintenance practices not only result in good telephone service but also in building good public relations.

"(6) *Sales Programs.* Effort should be made to sell all available types of service, keeping in mind that the sale of any service which does not result in a satisfied customer can ultimately create a dissatisfied customer and a loss in public relations."

Mr. Pollock began his telephone career in 1927 when he joined the plant department of the Wisconsin Telephone Co.

In 1928, he became associated with the Commonwealth Telephone Co. of Madison, now the General Telephone Co. of Wisconsin. For five years he was active in all phases of outside plant planning and appraisal work, later becoming plant engineer for the Commonwealth company and its affiliated companies—Illinois Commercial Telephone Co. (now General Telephone Co. of Illinois) and the Michigan Associated Telephone Co. (now General Telephone Co. of Michigan.)

In 1933, he became area plant manager of the Wausau district of the Commonwealth company, for whom he also handled commercial and traffic operations in that area. Later he became plant superintendent of the 40-exchange Northern Division of the company, which position he still holds for the General Telephone Co. of Wisconsin.

TELEPHONY's "Traffic Engineering Handbook"

Also in this issue, TELEPHONY is presenting the first installment of its "Traffic Engineering Handbook," by Gilbert R. Brackett.

With the growing importance of traffic engineering in providing adequate new and additional central office facilities, we have had numerous requests from Independent telephone companies for such a handbook and Mr. Brackett, an experienced traffic engineer, has endeavored to put into one series information on the subject which will be of value to traffic men of all Independent companies—regardless of size.

As. Mr. Brackett states in his introduction, the data presented in the handbook are "informational only and do not attempt, in any way, to replace or supplant such local instructions or directions that may be in use."

Presentation of the "Traffic Engineering Handbook" is in line with TELEPHONY's editorial policy of meeting the needs of telephone companies for information on techniques and developments which will help them meet the problem of providing adequate and up-to-date service in these days of constant change, improvement and expansion in the telephone art.

We hope you like the handbook, and if sufficient requests for reprints are received it will be reproduced under one cover, following full publication.

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

If federal telephone excise tax is shifted to states, it will be more difficult for the industry to get them reduced or eliminated. Welch wonders if customer surveys reflect just what the customer wants—should be constantly re-surveyed and re-surveyed at the real customer level.

TELEPHONE companies will be interested in a meeting of federal officials held at Chicago's Blackstone Hotel late last month to consider, among other things, switching the collection of telephone excise tax revenues from federal to state treasuries. It was a strictly "high brass" meeting, composed of Treasury Secretary Robert B. Anderson, representing the federal government, Gov. Lane Dwinnell of New Hampshire representing the states. Other members of the group included the governors of Maryland, Nebraska, Texas, Idaho, Massachusetts, Rhode Island, Pennsylvania and Kansas. The federal officials included Secretary of Labor Mitchell, Secretary of Health, Education and Welfare Folsom and Special Assistant to the President Harold Pyle, along with Budget Director Brundage.

How does it happen that this elite group should get together to discuss telephone excise tax collections, among other fiscal matters.

The answer goes back to the Governors Conference last summer in old Williamsburg, Va., when President Eisenhower was commenting upon the Kestenbaum report. This report (which grew out of the old Manion Commission on Intergovernmental Relations) was an effort to place some orderly line of demarcation between the spheres of federal and state responsibility. It necessarily follows, of course, that if states are going to take over more or less responsibilities, their tax sources will also have to be apportioned relatively.

Anyhow, among the responsibilities which President Eisenhower hoped the states might start taking over from the federal government, in whole or in part, are: School lunches, natural disaster relief, vocational education, old-age asistance and water pollution abatement.

Needless to say, that is going to take some money. And President Eisenhower recognized that many of the tax sources now being tapped by Uncle Sam would have to be turned over to the state publicans to balance things up.

Among these were the excises now being collected (10 per cent) on local exchange telephone bills. Nothing was said about shifting the present federal tax on interstate long distance calls (also 10 per cent). Other taxes now being collected by the federal government, which the committee is considering switching from federal to state collection, are excises on theater and other entertainment, including night club and admission fees, initiation fees, coin operated amusement devices, various games taxes, and leases on safety deposit boxes. The whole deal involves around 504 million dollars a year.

On the merits of this proposal there will be a few objections, even though many details must be worked out. It is true the Conference of Mayors and some labor unions are opposed to the idea because they think their own state governments ("dominated by rural legislators"—to use the propaganda phrase) would not be such pushovers, for organized city pressure for give-away programs, as Uncle Sam is. But President Eisenhower's idea is that local responsibility is a good thing and would encourage some attention to economy. Nobody seems to give a hang about economy when Uncle Sam is picking up the tab. These so-called "rural legislators" know these city bosses from away back, and vice versa.

But, the telephone companies have a more serious problem here. If this switch is ever made—and it is still very uncertain that it ever will be made—it may well mean the indefinite perpetuation of telephone excise taxes, at the local level. As long as these excises were (and are) enacted by a central congressional authority, there is always a chance that the USITA and other pleaders for the industry's welfare might be able some day to persuade Congress to cut down, or cut out, these taxes—which were originally started under the disguise of a temporary emergency nearly a decade ago and are still hanging around.

One does not have to be well versed in the ways of politics to realize that if this power to tax is once delegated to 48 states, the chance of doing away in the future with the telephone excise tax will be pretty slim. It would mean lobbying in 48 state legislatures. Indeed, it would probably mean the building up of pressure in the other direction—to *increase* these taxes for the benefit of state treasuries.

One can imagine the situation in the state where sharp differences over a rate case have broken out between a telephone company and the local political machine. The telephone company might take their case to court and win it. But the politicians would always be able to say "All right, you licked us in court, but we'll get it back in the legislature." It is not a promising prospect and it is something to be watched closely. It is a fair question just why Congress feels it has a moral right to delegate such tax collection authority, at all. If Congress can give, Congress can take away. But can Congress turn an industry over to the mercies of a state political machine? That is a real question.

Complaints From a Reactionary

The moralists of our day, which it must be admitted seem to be more in supply than demand, keep telling us that all change does not necessarily mean progress. And, it is a good thing for telephone people to keep in mind, in these days of magical marvels of automation. The telephone exhibits this writer saw recently at Grand Central Station in New York City, revealed a number of new gadgets and dohickeys in the telephone trade. They fairly take one's breath away with the beauty and comfort and efficiency of it all.

There was a peek into the telephone future! Experimental models, small and light, suitable for a bedroom. Such a telephone, visitors are told, may one day be part of a home telephone system enabling conversation from room to room, even with someone at the front door. There's that new idea in dialing ("key pulsing") which has push buttons instead of dial wheels. There was a spread on transoceanic cables. Nice show.

All these are fine and worthwhile things, no doubt, based on a firm foundation of scientific research and customer surveys. There is a clear promotional field for all of these items, to anyone with half an eye. But isn't there also at least the outside possibility that some customer surveys can get so far out of touch with (or so far ahead of) what the mass of customers *really* want—when it comes right down to paying for it—that the promotional department could find themselves just a little bit in danger of going out on a limb, while the parade is marching the other way?

Examples? It's easy to pick on women's fashions which have been going around in approximately 20-year circles ever since grandma's bustle and leg-of-mutton sleeves. And Rip Van Winkle who bolted down his mickey in the last year of prohibition would feel so at home if he woke up and looked at the cloche hats and burlap ensembles now being shown at the more exclusive couturieres in New York City, that he'd be likely to break out in a Charleston.

But, there are examples nearer at hand than the fantastic world of Dior and Chanel. Have you tried to buy an ordinary bottle cork lately in a modern store? Or ordinary pitch for a leaky boat or rainspout? Ask for a vest with a new suit in a man's clothing store and the clerk will positively blush—maybe even burst into tears. And, if you press your request, on behalf of the warmth and comfort due to middle age, he'll show you a cross-colored flag or awning thing that would make *you* blush, or cause all the dogs to bark in outraged terror for blocks around, if you dared to wear it home.

Good old reliable naphtha soap is as hard to come by as a detachable collar—or a shirt to go with one. Instead, you must now buy a latherless form of sneezing powder, which some actor on TV dressed up in a white coat, to look like a doctor or a scientist, positively assures us is so efficient that all you have to do is throw a pinch or so over your left shoulder, and the soiled clothes just jump up right out of the hamper into cellophane bags, press themselves, and then lie down stacked in dresser drawers. At least that's what the little pictures appear to do on TV.

Not long ago this writer delivered himself into the hands of the Philistines and bought a new car (neighbors had been complaining about the old one). It is a nice job and seems to work all right except it uses a good bit more gas of only such superior quality that the driver feels like trying a drink of it himself. These high-tail fins give one a first impression of driving through an alley but everybody gets over that.

Another thing, however, appeared at first to be an optical illusion. The car seemed to be built so low that the passengers are in danger of dipping sand in their pockets, going fast around curves. But it was *not* an illusion. Your correspondent happened to come out of a parking lot and crossed a paved gutter with a dip in it no deeper than a straw hat. There was a jolt and grinding noise. Next, the good old oil pan under the engine, with all its works and pumps, came right off in the street. The dealer didn't even apologize. "Customer surveys show" he said solemnly, that "the public likes that low ground-hugging look." My model must have confused ground-hugging with bulldozing. One wonders who conducts these customer surveys, and who answers them. They certainly didn't ask me.

The Othman Special

What is the Washington angle here? Not very much, except that all Washington seems to be laughing these days about a recent Scripps-Howard newspaper column written by that delightfully droll Washington journalist, Fred A. Othman. Writing in the Washington *Daily News*, Fred revealed last month that he is coming out with a brand new car—the "Othman Special." It will have some wonderful new features—features which millions of present-day drivers probably never heard about.

First, it will have a crank. A crank, junior, is a tool for starting the car on the coldest mornings. Fred's competition in Detroit insists the crank is too dangerous to use on modern high compression engines—liable to break your arm off. But my boy Fred is way ahead of them there. He's coming out with a *low* compression engine. It'll use any kind of cheap gas, even a mixture of kerosene, if necessary. It will only deliver about 65 horsepower and about twice as much mileage. There'll be no "wrap-around" $100 windshields to squint through—just some plain old flat plate glass, much easier to see through, at $8.00 a pane.

Two other features on Fred's car are: (1) Something called a "choke", and (2) running boards. A choke is a thing you pull out of the dashboard, when the motor's cold; and it is guaranteed to start the car. Running boards, children, are two long strips mounted lengthwise outside the car, a valuable feature which Detroit stole from us when we weren't even looking. Fred's car will have something called a drive shaft which will be *under* the body—not inside of the car. There will be no "ground-hugging," on account of Fred is going to have wheels instead of doughnuts. This will enable the passenger to ride around with some dignity and safety of height, instead of being hauled through the dust like a casket on roller skates. Best of all, the whole deal will cost about half the price of the gas-guzzling monsters from Detroit.

Fred hasn't quite gotten together the financing part but he doesn't expect too much trouble. After all, Henry Ford started with only $18,000. Ironically his grandson (Henry's not Fred's) said last month it cost about a billion dollars to bring out the new Edsel. Shows how the younger generation has lost the knack of things.

Check These Surveys?

But there's a moral to all this.

This technically unqualified observer is going to rush in where angel scientists fear to tread. That is to suggest that customer surveys might be constantly re-surveyed and re-surveyed at the real customer level. And, that some effort might be made to put up with reactionaries who actually like what they used to have.

Take this writer, who wears a hearing aid. For years and years, when the telephone receiver was detachable from the transmitter, it was a very simple thing to put the receiver directly over top of the aid. It worked fine. Next, the craze for cradle type telephones. Understandable. But can anybody still get a detachable receiver now for love or

(Please turn to page 46)

Complete expected plant life is obtained only when the future service possibilities are fully explored.

Design and Operation of Small Companies

By R. J. POLLOCK

PART 1
The Service Area—Potential Service Possibilities

A REQUEST for telephone service which cannot be filled because of the lack of facilities, either switchboard, cable or open wire, is not too serious if the overall growth in the exchange area has not exceeded that which was anticipated when the plant was built. However, if the present telephone requirements exceed the ability of the facilities to carry this additional load, then it will be necessary to partially or completely rebuild the exchange.

In preparing the outline which appears on page 19 of this issue, it was assumed that a rebuilding job was to be undertaken, covering the complete exchange, including the central office equipment, and it is proposed to follow through this outline taking the steps in sequence which would be encountered in an undertaking of that kind.

This work can be done by an engineering firm or by company personnel who are familiar with the operating area and its growth possibilities. In the event an outside firm does the work, this discussion will serve as a check to show whether the final plant will cover the exchange rehabilitation requirements.

The Service Area of any exchange is a boundary line drawn around the rural territory surrounding the city or village in which the company is obligated to supply telephone service to the people located within it. The location of this line is more or less determined by the community interest of the people involved except in special cases, such as resort areas where toll service is of prime importance.

In densely populated areas, the boundary line between communities has been established by past subscriber requests while in the more sparsely settled regions it continues to expand with the desire of the residents and their ability to pay for telephone service.

If it were possible to definitely predict the population trends and the demand for telephone service in any given exchange area for definite periods in the future, the problem of supplying telephone service when it is wanted would be greatly simplified. Unfortunately, this is not the case so that it is necessary to make a detailed survey of the area in order that a fair estimate of the present and future customer demands can be secured. If this is not done, it is possible that the company will have requests for telephone service which it cannot supply within a short period of time after the plant has been rehabilitated.

The Potential Possibilities for telephone service in any rural and urban area should be determined with the thought in mind that customer satisfaction and acceptance of it is of prime importance. In other words, the customer should be made to feel that he is getting a "full pound" of telephone service for his dollar. How well this job is done will be reflected not only by the number of complaints on so-called poor service brought to the man-

ager and the girl in the commercial office, but by the effect it has on company operations which cannot be considered in dollars and cents.

These points are brought out at this time because in order to complete a survey of the area a large number of residences and business places in the rural area which do not have telephone service will have to be contacted. These contacts usually bring out some interesting customer feelings which can be used in the design of the plant to serve the area. Some of these will be discussed in order to illustrate how they affect the plant that is to be constructed.

Some prospective rural customers feel that they do not want service because of heavy line loads, along with some customers using the line far beyond the time which would normally be expected. Others feel that service is not available other than on a loaded line so that they have not applied for it, but they might have if it were not for the objectionable code ringing. Also, there are those people who have never had service and, therefore, feel that it is not needed but, with growing families being educated in modern schools and with good roads and automobiles, this picture could change very rapidly. The result of this could be a loaded line plus unfilled orders for service.

The consolidation of small farms into larger operating units and the present practice of city people moving to farm areas for residence purposes only, also affect the rural picture in that the trend will be to single, two, and four-party service in place of a rural line. It can be very discouraging to find that single line service is requested at an expensive residence that is being constructed in Farmer Jones' corn field next to the river, 6 miles from town, especially if the plant was not designed to take care of this additional load and others like it.

These are some of the reasons why all locations do not have a telephone, but there is another one which clearly reflects human nature, and that involves the person who wants to be sold on the idea of having service. It is surprising to note the number of persons of this type whom you encounter on a rebuilding job.

A survey made with these thoughts in mind should produce a reasonably accurate picture of the rural customer requirements for a five and a 10-year period. Beyond that time any estimate would require a greater amount of guessing although the trend established in the first two periods should continue beyond that time providing the general economic condition of the country does not undergo a decided change.

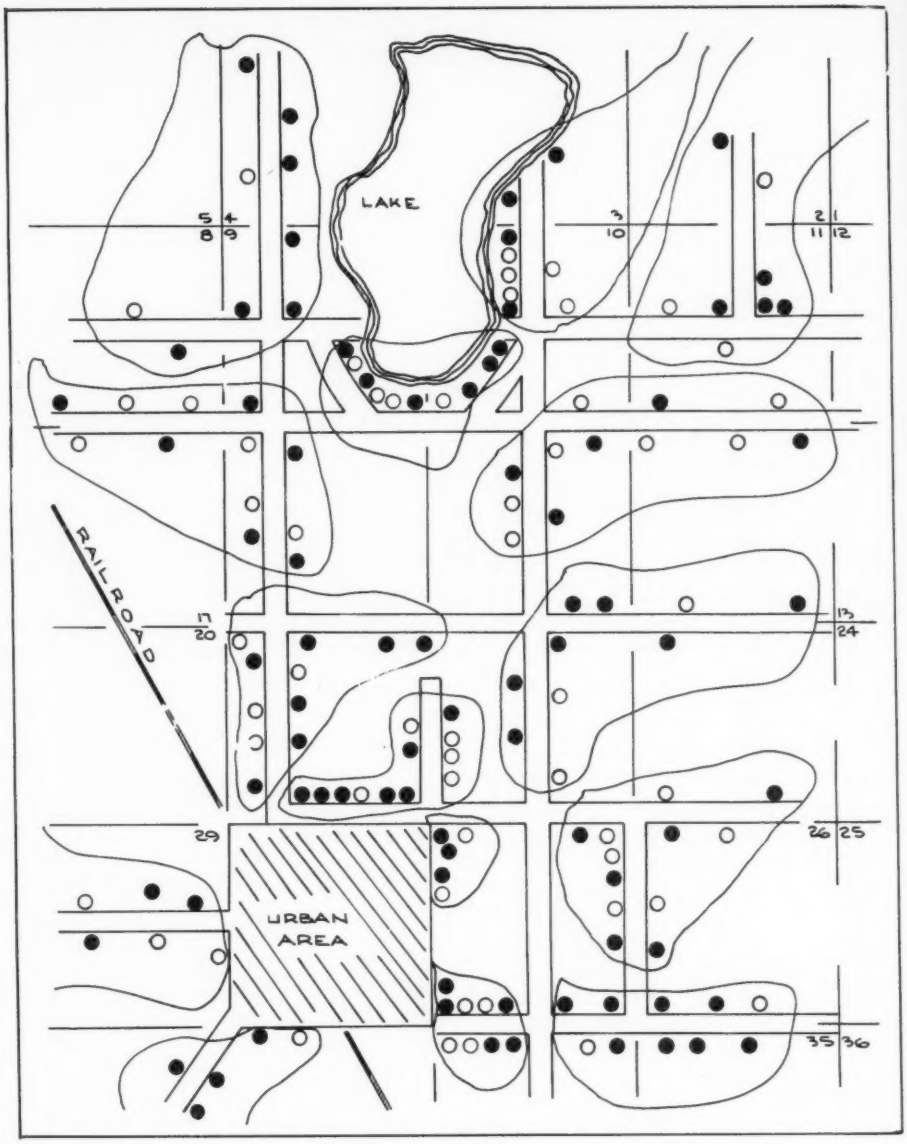


Fig. 1

The proper time to make this survey will depend largely upon the community and its growth in the immediate past. If this growth has been slow, the field work can be done months and even a year or two before the actual work is started providing that a recheck is made before the estimating work is started. On the other hand, if the growth picture has been rapid, the work should be done just before the actual engineering work is to be started.

The difference between the two conditions can be readily determined by the number of inquiries received for new service compared with similar requests in past years.

The completion of this rural canvass or survey will give the expected growth for the area. This added to the existing customer load, along with those who have actually applied for service, will give the necessary data to determine the lines needed to supply the area.

However, a map of the rural area should be prepared to show the location of the existing customers and the various prospects in order that a satisfactory rural plant can be designed to meet the requirements.

Fig. 1 is a section of a suggested rural map which should be drawn to a scale of 2 inches to 1 mile, and should be drawn on tracing cloth with drafting ink. The details of the map can be secured from county plat records, highway and postal department maps and government aerial surveys.

From the completed map drawn on tracing cloth or onionskin paper, brown or black line prints should be developed rather than blue prints since they are much more durable. Considerable effort should be exercised to produce a neat and orderly map since it should be used not only for the original survey but also as a construction print and as a record of the rural plant,

which will be covered in succeeding articles.

The preparation of this map may present some difficult problems, especially if the company does not have an employe with some training in drafting practices. In that case, it is suggested that the job be turned over to a person not connected with the telephone company, such as the county surveyor, a draftsman working for a local concern, or the local high school drafting teacher. A recent exhibit of a county map produced by boys connected with the Future Farmers of America showed that an excellent job of mapping can be done without extensive experience in the drafting field.

Each existing customer should be spotted on this map in pencil by means of a symbol which would represent a telephone in service. A solid circle can be used for that purpose. All prospects should also be shown, preferably by a circle which is not filled in.

In order that the line load can be definitely determined, it is advisable to indicate which prospects will take service when it is available in connection with the rehabilitation program and those who might be connected in the future. This can be readily accomplished by filling in the new customer circles with a different colored pencil.

When all existing customers and prospects have been located on the map, it is possible to determine the line loads in all directions from the exchange. This brings up the question of what is meant by a line load. It is not unusual to have magneto lines with 15, and even more, customers on some lines.

This practice is not acceptable to many regulatory bodies and it certainly is not conducive to good public relations in that it cannot be called good telephone service. Common battery and dial lines reduced this figure to 10 because of ringing frequency reasons, although there are some common battery and dial operated lines in service today which have ringing equipment which permits more than 10 per line.

There has been a considerable reduction in the use of code ringing in recently designed plants mainly because of customer reaction to hearing the ring of all or part of the telephones on rural and urban party lines. With full selective ringing, the customer is inclined to think that a party line is more like a single line, except in those cases when he tries to use it and it is busy.

However, if all customers on a party line are normal telephone users, selective ringing will reduce the complaints received even on fully loaded lines, since the only way it can be determined if the line is busy is to attempt to use it rather than by listening to the rings of the other customers.

It appears that present-day customer demands will ultimately require that maximum rural line loads be reduced to five or six per line and many of the more recently rehabilitated exchanges will be operating on that basis within the next 10 years. However, in order to have the rural plant carry a proportional share of the additional investment involved, the rural rate structure will have to be revised to reflect this condition.

With some companies, it is possible under their present rates to have four-party service within a mile beyond the base rate boundary for urban service at a cost equal or less than that which would be charged for rural service at the same location.

The thinking of your state regulatory body would be of considerable help in determining the maximum figure to be used in determining the line load. It is suggested that the load not exceed seven per line and should be below that if the area has a considerable number of prospects. The underlying thought here should be that the customer will be inclined to pay a higher rate for service that is more frequently available to him than he would for service on a busy line.

With the line loads established, the customers on any proposed line can be indicated on the map by drawing a pencil line around them, and by counting those enclosures along with any single or party lines outside of the base rate area, we can determine the lines required to feed the rural area. The possibility of pay stations in outlying locations should also be considered.

(Please turn to page 49)

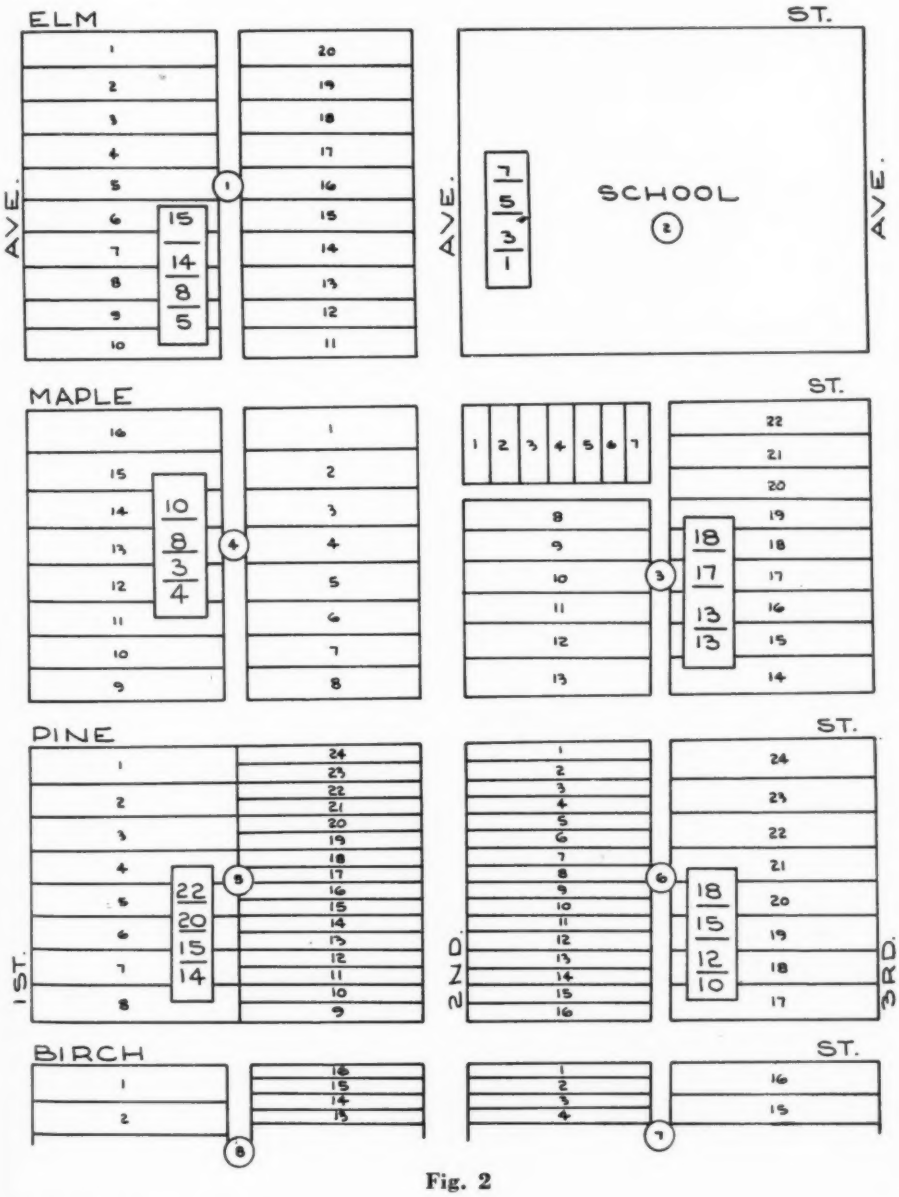


Fig. 2

THE SUPERVISOR

Vital Link in Management Chain

By GILBERT R. BRACKETT

THE SUPERVISOR is one of the most important links in the management chain. The "know-how" of supervision can do much toward building and maintaining the good human relations so necessary to a smoothly operating organization.

Human relations begin with sincerity of purpose, right thinking and thoughtful acting — best obtained by careful job analysis, gaining the confidence and cooperation of the workmen and developing the right appraisal of a supervisor's responsibilities.

Present-day management can neither afford to hire people who lack the capacity to become competent employes, nor can it afford to overlook proper training to bring out each employe's best performance. Today, we cannot just hire people. We must make every effort to select the most desirable people available and, once they are members of the group, assist them in improving their value as an employe.

Cooperation Not For Sale

Cooperation cannot be bought and it cannot be enforced. Like friendship, it must be developed. A man may sell his head and his hands but not his heart, and manpower lacks the will to accomplish without the heart. An employe who does not have his heart in his work will never become a top performer.

A supervisor must first of all be sold on his job and sincerely believe in the policies of his management. Only then will he earn the friendly relationship, confidence and respect of the people he supervises.

Supervision is really not a tough attainment. It is merely believing in and following the "Golden Rule," treating people in the manner the supervisor would like to be treated—by being sympathetic, understanding and considerate. In other words, putting himself in the other fellow's place.

There is a certain amount of personal satisfaction for the supervisor to have good relations with his people. His work becomes easier and more pleasant and the resulting extra effort on the part of his workmen will stand out as a monument to his endeavors.

No Place for "Driver"

The "know all" has little chance to succeed as a supervisor. He seldom coordinates his ideas with those of other departments. He is not alert to pass on those matters beyond his scope of responsibilities and thereby promotes troubles for himself.

The "hard boiled boss" has no place in business and neither does the "driver." Proper supervision calls for the democratic approach in which the leader builds up responsibility in his people. The democratic way, and that doesn't mean coddling the worker, calls for a full day's work for a full day's pay. It demands consideration for the reasonable desires of human beings, a fair understanding of human behavior, and what it takes to help people to be happy and contented in the work they are doing. The leader who makes a sincere study of human relations will be in a better position to stimulate and motivate employes under his supervision.

Fortunately, most people get pleasure out of cooperating. But, whether a leader supervises one person or a hundred, it is vitally necessary that he understand the importance of supervision. Simply told, it means treating people in a manner that will make them want to do a better job and get good satisfaction out of doing it.

Some supervisors do not take the time nor have the patience to treat their people as they would like to be treated. A man's success as a leader, his ability to sell his people on the importance of their work, will hinge upon his interest in his own job. The knowledge of supervision will help to qualify a person for a better job but, more than that, it also brings about a great deal of personal satisfaction.

To perform properly, an employe must be happy and satisfied with his job. He must have pride in what he does and look forward to coming to work. He must have the desire to produce with quality and efficiency. He must be trained so as to possess complete knowledge of the most efficient way to perform his job.

Wages are not the only reward and incentive in which an employe is interested. The dignity of man must be recognized. Men and women work more at ease under conditions of contentment. They resent being told what to do. They look upon their job as a partnership, they want to do the job with management. Financial security is important, of course, but personal or emotional security is also a must for good job performance.

New Employe Needs Help

The average employe desires a feeling of stability, recognition and an opportunity for self-expression. He has need to maintain his self-respect and it is necessary that he feels his personal dignity is being upheld. Good working conditions, pleasant relationship, sharing responsibilities, praise for a job well done, opportunity for progress, health and safety provisions, and recreational and social facilities, all contribute to the emotional stability of the individual.

The most productive field for the furtherance of human relations is the new employe. The first few days are difficult

and trying for him. During his initiation he formulates definite and lasting impressions of the company, his associates and his supervisor. If he goes home at the end of his first day with the feeling that he is going to like the job, the company, the other employes, and his supervisor, the introduction program is merrily on its way.

A new employe's instruction should be a continuous process until such a time as he has a feeling of belonging, as well as the feeling of job security, stability and opportunity. Once he is made to feel that he is a member of the team, he is less apt to become a critic of the umpire—the supervisor.

It is one thing for the supervisor to be able to do the job himself, but quite a different matter when he is called upon to explain it to another. The average worker resents having his supervisor interfere with his job. When the supervisor allows an individual to do the work assigned to him, he makes that man self-reliant, builds up his confidence in himself and encourages him in his efforts in spite of any difficulty he may encounter.

Must Set Example

There will be times, of course, when due to the importance of a situation, a detail should be handled by a more experienced person or by the supervisor himself. When this happens, the employe relieved should know why he is not to do the work, if his job confidence is to be maintained. Once a leader assumes responsibility for work done by others, he cannot lessen his obligations by doing the job himself when the going gets rough.

Follow the precepts of personnel management. Set a good example. Show a sincere interest in each employe. Help him to like his work and want to perform for the personal satisfaction he will get from a good performance. Make him feel that he can ask for and will receive help whenever it is needed. Do not forget that you are working with human beings and that they do not operate with the precision of a machine.

The leader of men not only knows and understands each one of his people, but he is cognizant of his own short-comings. He knows that not until he repudiates visionary ideals and thinks and acts in the light of things as they actually are, will he become tolerant of others.

Employes lose respect for the supervisor who is always "blowing his top." When the temper shoots skyward, get away and allow it to cool off. Never make a decision when angry or upset. It may have to be changed later and that is not conducive to good personnel relations.

A supervisor can get to know his people by asking himself:

"What is my personal opinion of the worker?"

"What kind of work does he do?"

"How well do I know him?"

"Does he have the ability to accept reverses calmly?"

"Can he carry out work assignments without close supervision?"

"Is he proud of the company—the work he does?"

"Does he like to stick to one job or is he inclined to wander?"

"Are there some things about the job he does not like?"

"Does he have outside interests or hobbies?"

"Is he sensitive, easily hurt by criticism or suggestions?"

"Does he have certain qualities, abilities or possessions of which he is proud?"

"Is he of leader quality?"

Judging Employes

The important thing in leadership is to study each workman in a manner that is fair to him and other members of the team. When you do so, each employe will then have the feeling that you are sincere, dealing with him personally and that he will be given full credit for his accomplishments.

A workman who may perform an operation or function poorly should not be judged by a general impression of the individual. Likes or dislikes for certain traits should not bias or prejudice a decision. The important thing is to take with all seriousness the matter of rating others.

The mere judging or rating of an employe does not offer satisfactory cure for an unsatisfactory performance. The remedy for poor work does not lie in isolated periodic ratings, but rather in continuous day-to-day training that can be supplied by a competent leader.

The quality of a product depends upon the skill of the individual who makes it. There are differences of opinion as to the fairness of methods by which information relating to skill is obtained and used. However, the fact remains that competence and "know-how" are qualities in which both supervisor and workman have a common interest.

Fair judgment can best be brought about by relating together the aptitudes and capabilities of the man to the requirements of the job, the matching of man and machine, the coordination of the desires of the employe, and the requirements of the management. A leader's aim, therefore, must be one of helping his people develop a better product through the use of methods best suited to the particular job requirements.

Being Good Listener Helps

A supervisor cannot expect all his workmen to be top performers—there is no such perfection. When an employe feels that his leader knows him and is trying to help him enjoy his work, he will welcome his assistance and seek his advice instead of resenting his suggestions because he has the thought his supervisor was prying into something that was none of his concern.

A good listener learns many things about his people by encouraging free discussion. The supervisor should not start off by giving his point of view. He shouldn't make a "Quiz Program" out of a discussion. It is his job to listen, not talk. For performance's sake, he must not argue. Each individual has a right to his opinion and usually likes to express it. Talking lets him get little things off his mind and prevents them from "snow balling" into real problems.

Discussion helps the employe to understand his weakness and his strength. It assures him he is not "the forgotten man," that the supervisor is interested in his progress and welfare. The worker should be encouraged to develop his own solutions to job problems and work improvements. The supervisor should help him make such solutions his own goal and not that of the leader. The employe should know definitely where he stands and what should be done next. He should feel that he will be given any help he may need and that he can call upon his supervisor for that help whenever necessary.

Employes with long terms of service are apt to resent a new supervisor. They think they know more about their particular job than he does and, because they may be right, they refuse his suggestions. It is up to the supervisor to prove his worth, that the management knew what they were about when they put him in charge. He will not depreciate his authority nor lower his dignity when he acknowledges an older employe's experience and asks his help. Such recognition usually results in approval, cooperation and happy employe relations.

Don't Undervalue Intelligence

Do not underestimate an employe's intelligence. If the workman has enough intelligence to ask a question, he is clever enough to understand an explanation, providing it is given in a clear manner. Recognizing a work-

(Please turn to page 51)

XUM

Step Back for a Long Look

by John Voss

Not long ago I happened to wander into an art gallery for a look around.

I don't often get a chance to look at paintings. And I guess where art is concerned I'm like most of you—I don't know much about it, but I do know what I like.

But it was obvious that some of the people in this gallery were experts. At least, they acted that way. Looked a little strange, too. They'd inspect a picture close up for a while. But pretty soon they'd back off and look at it from a good distance. Some of them even put up their hands alongside their eyes—like putting blinders on a horse!

Well, it was all very interesting, and it made me kind of curious. So when nobody was looking, I tried the experts' stunt myself just to see if it really made any difference. And you know, I learned something!

When you look at a picture close up, you don't get a whole lot out of it. Oh, you pick up interesting details that you might otherwise miss, but that's about all. Sort of can't see the forest for the trees.

But when you step back a ways and look at the *entire* picture, you see the forest *and* the trees. And you get a feeling that you're *really seeing everything there is to see.* There's an important business lesson here for all of us.

You see, at Stromberg-Carlson we pride ourselves on the fact that we offer one of the *most complete lines of products in the independent telephone industry.* Some independent operating company executives are missing this important fact by thinking about equipment a piece at a time—like looking at a painting close up.

Let's get down to actual cases. When you look at our complete line and at our competitors' products, this is what you see:

Step-by-step CDO equipment. We have it. Two others do not.

Toll Boards, No. 3 type. We have them. One of the others doesn't make a complete board. Two can't touch our delivery schedule.

Convenience systems. We have them. None of the others does.

Cordless switchboards. We have them. Only one other makes anything similar.

Toll ticketing. We have it. Only two of the others do.

Instruments. Out of the 26 major needs for standard and special-purpose telephones, we fill 25. The nearest of the others fills 12.

And so it goes. While other independent manufacturers offer several types of products, none comes anywhere near matching the completeness of our line.

If you've never seen the whole Stromberg-Carlson product line, why not step back and take a long look? It makes a beautiful picture.

John H Voss

Vice President and General Manager
Telecommunication Division

STROMBERG-CARLSON, A Division of General Dynamics Corp., Rochester 3, N. Y.

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

A COMPLETE home telephone communication system, at a relatively low cost, will soon be tested by the Bell System in the homes of customers in Baltimore, Denver, and Pittsburgh. This step-saving home communication system was developed by the engineers of the AT&T company.

This system will provide one central office line, two or more telephones, voice communication between any of the telephones, hold, and code signaling using the regular bell in the set.

For example: Pop answers the basement telephone and the call is for teenage Mary. He holds the call and shifts the intercom by turning a button. Instantly, a general alert "ding-dong" sounds. He dials "1" twice, which produces "ding-dong ding-dong," and Mary upstairs recognizes her code and picks up the call.

The system can also be used for intercommunication even when there is no outside call involved.

If the customer desires, a doorbell-answering microphone and speaker can also be provided.

The plan calls for the sale on a trial basis of about 200 of these systems in each location. The main objective is to determine how well the system meets people's needs, what ideas they have for additions or changes, and what is the best way to merchandise it. Users will be interviewed after they have had several months' experience with the system.

•

Back in 1906, the University of Cincinnati inaugurated the cooperative plan of education for engineers under the leadership of Professor Herman Schneider. There are now 60 colleges in the United States known to have cooperative programs and a number of others are at various stages of development.

There are approximately 20,000 students enrolled in these schools who are employed by 4,300 industrial firms and government agencies during the work phases of their program. This program should contribute much to alleviating the present-day shortage of trained engineers.

•

We never cease to marvel at the traffic control of airplanes made possible at large, modern airports by making proper use of the necessary communication facilities. Recently, we were on a plane at New York's busy La Guardia airport waiting to take off for Washington. We were about the sixth plane in line.

One plane would come in for a landing and about a minute later one would take off. We could watch the approaching planes and they would take an extra wide turn if necessary to consume time so that they would take the proper interval for the final run and landing on the runway. This all worked like clockwork and one could not help but be impressed by the skill of the pilots and control tower personnel.

Finally it came our turn and as we were airborne and turned south over the Hudson River I looked back and saw another plane rolling down the runway and the plane that was behind us getting ready to take off. This, in our opinion, is true modern communication and split-second coordination at its best!

•

While visiting the Central Virginia Telephone Corp., at Amherst, Va., recently we noted that each of the construction and maintenance trucks were equipped with light-weight aluminum ladders. In our opinion, this is an excellent idea as this type ladder is strong and long-lasting and does not require the care and maintenance which the wooden variety does.

Some telephone companies will not use metal ladders due to the danger of their making contact with power-carrying wires and causing injury to the workmen. However, it is our belief that if workmen are properly instructed in the use of these ladders, this danger will be nil. There is every probability that more accidents will be caused by hidden faults in wooden ladders than by the power-conducting qualities of the metal ladders.

•

Two out of three long distance calls today in this country are dialed by the customer or one operator. By the end of December 1956,,over 5,400 communities in the United States could be reached by operators dialing directly to the distant number and over 65 per cent of all calls handled at long distance boards were being dialed by operators.

In addition, Direct Distance Dialing (DDD) had expanded to the point where 2,430,000 customers could reach any of 29,700,000 telephones by dialing directly.

•

It is reported that the Bell Telephone Laboratories have developed a method that firmly bonds polyethylene plastic to rubber, brass and brass-plated metals. This new technique is based on a synthetic adhesive known as "partly hydrogenated polybutadiene," that is said to be so strong that it will resist a pull of about 1,000 pounds per square inch, or many times the strength of the present best bonding agent.

Heretofore the bonding of polyethylene or other plastic insulation of the conductors in a cable was not desired. This was due to the fact that it was necessary to remove the insulation from the conductors for splicing. However, with the development of a splicing sleeve that makes contact with the conductors through the insulation by a compression action, perhaps a bond between the cable conductor and the plastic insulation will prove desirable.

TELEPHONY'S Traffic Engineering Handbook

By Gilbert R. Brackett **Oct. 12, 1957—Page 1**

Table of Contents

	SECTION
Introduction	1
What Is Traffic Engineering	2
The Traffic Engineer's Job	3
The Step-by-Step Automatic System	4
Traffic Engineering Assumptions	5
Line Finders	6
Connectors	6
Selectors	6
Second Selectors	6
Level "1" First Selectors	6
Levels "2" and "3"—Second Selectors	6
PBX Tie Trunks	6
Intercepting Trunks	6
Out Dial Connector Trunks	6
Conference Equipment (PBX)	6
Reverting Call Switches	6
PBX Level "0"—Operator Trunks	6
PBX Level "9"—Central Office Trunks	6
PBX Central Office Two-Way Trunks	6
Repeaters	6
Incoming Selectors	6
Selectors and Connectors—Toll	6
Capacity Tables	6
Assignments of Line and Station Numbers	7
Customer Usage	8
Traffic Surveys	9
Equipment Nomenclature	10
Miscellaneous Traffic Information	11
Traffic Load Estimating	11
Distribution of Holding Time (PBX)	11
Bell System Standards for Ringing and Silent Periods	11
Maintenance Items to Look For on Switchboard	11
Automatic Exchange Classifications	11
Traffic Information	11
Inter-Departmental Cooperation	11
Approximate Current Drains—Step-by-Step—Automatic	11
Judgment Methods Which Assure Reasonably Good Results in Engineering	11
Handling Overloads	11
Traffic Engineering Short Cuts—Automatic	12
Traffic Engineering Short Cuts—Manual	12
Short Cut Method—Toll	12
Short Cuts—Power Requirements, Switch Type C.O.E.	12
Graded Multiple	13
Graded Multiple Engineering	13
The Traffic Unit	14
Force Adjustment	15
Toll Switchboard Requirements	16
Traffic Space Requirements	17
Central Office Management	18

Section 1
Introduction

This handbook has been developed to provide brief explanations of traffic engineering principles and their application to the smaller step-by-step automatic exchanges. It is informational only and does not attempt in any way to replace or supplant such local instructions or directions that may be in use.

It is hoped that the reader may gain some idea of traffic engineering, its importance to the telephone industry and the administration of its functions to provide new and additional automatic central office facilities. These pages also contain a miscellany of traffic data which, while not pertaining directly to traffic engineering, will assist the traffic engineer in the administration of his job and permit him to answer general every-day questions on traffic functions and performances.

The procedures suggested are based on engineering experience and service results. This means discretion and keen discernment and judgment must be used in applying the suggested methods to specific problems which depart from normal. Using these data in a manner for which they are not intended or not fully understanding their proper application could bring about excessive costs and/or poor service.

It is understood that some telephone companies do not have traffic engineers, as such, but even so, it is felt that the information contained in this handbook will be of value and help to anyone who might be charged with the responsibility of traffic engineering. It should also be of assistance to the employe who is interested in the traffic engineering phase of the telephone business as an introduction to a better understanding of the industry as a whole.

Acknowledgement is given to the American Telephone & Telegraph Co. and its associated companies for the assistance given and for the use of information taken from their practices and contained in this series.

Suggestions for changes, revisions or additions to this handbook are solicited.

Section 2
What Is Traffic Engineering?

All traffic engineering is based on a calculated grade of service during the office busy hour and continuing through the busy season. Occasionally the traffic will exceed such limitations. Holidays, special events, emergencies, catastrophes and other occasions can promote traffic to a degree far greater than was engineered into the equipment. To engineer for such traffic extremes would be prohibitive from both a cost and a common sense angle. Such traffic is not predictable. And, so, because of these circumstances, there will at times be

We switched to Penta-treated poles because the records prove they're better

Ran into Ernie—he's division maintenance super—in the pole yard yesterday. He asked how things were going in purchasing, so I told him that among other things the new specs had come through and we'd been busy changing our purchase orders to Penta-treated poles and crossarms.

Right away Ernie started telling me all over again why he'd recommended the switch—that Penta-treated poles are cleaner and easier to handle. He reminded me that U.S. Government tests and service records of other utilities prove that Penta keeps rot and termites out of poles and gives them a longer service life. And he mentioned that many other utility companies are switching to Penta, too.

After he got all through, I assured him that specifying Penta caused no special problems in purchasing because Penta-treated poles and arms cost no more than those treated with old-fashioned preservatives.

THE DOW CHEMICAL COMPANY, Midland, Michigan, Department PE 502E-1.

YOU CAN DEPEND ON DOW

periods when traffic will exceed the load carrying capacity of the equipment engineered.

All telephone equipment and trunking is sensitive to overloads and service deterioration is sometimes reflected when unplanned for extra heavy traffic occurs. Therefore, accumulative traffic data must be accurate within a few percentage points. Such data should cover normal busy periods so that the best possible service can be maintained during abnormal conditions.

Equipment requirements are obtained from probability tables, based on a specific grade of service and a known volume of traffic. But these tables are capable of providing the desired grade of service only if correct engineering procedures have been used in the physical arrangement of trunking and if the assumed volume of traffic agrees with the actual load passing through the office. Every caution must be maintained to secure as accurate an estimate of traffic as is possible, and to carefully keep current a record of traffic loads occurring throughout the life of the equipment.

The basic measurement of the telephone business is the number of calls handled. Traffic peg counting is the process which provides counts of calls of different classes at intervals of such frequency as to furnish a reliable picture of the hourly variations, as well as the seasonal growth and any changes that have occurred.

The engineering of the proper type, quantity and arrangement of central office facilities hinges on the collection of representative and factual traffic data. This includes data for new installations, data for the removal of existing facilities no longer needed, data for additional facilities to give the desired grade of service, and data for the rearrangement of facilities in use to provide efficient and economical operation.

Traffic peg count records provide information concerning traffic volume, loads and costs that are necessary for engineering and administrative purposes. The data secured are so arranged they can be conveniently used for purposes such as force adjustment, equipment and building studies, estimating and analyzing costs of operation, balancing equipment loads and assembling statistics on the volumes and trends of traffic.

The performance of any telephone equipment can be only as good as the traffic data upon which it is based. Every precaution must be used to obtain accurate traffic records.

The frequency of traffic counts to maintain such records will depend on the size, rate of growth and changing trends of traffic for the exchange under consideration. Once the traffic counts are obtained, due consideration should be given to their development.

Although traffic engineering procedures are well established for providing equipment to care for present needs and expected growth, the economical operation of the office to produce acceptable service is so dependent on having adequate and properly arranged facilities that this is a matter of the utmost importance in traffic supervision and administration.

In the case of exchanges requiring major additions or rearrangements, many problems arise which require an intimate knowledge of the service level that will be acceptable to the customer, and the operating and local conditions as they exist. There are, also, many equipment items, such as line assignments, trunk designations, switchboard bulletins, etc., in which the local people are directly concerned in the day-to-day operation of the office.

For these reasons it is essential that the traffic engineer coordinate in every way with the local organization in the administration of central offices. While plans for additions and changes are generally initiated by the traffic engineer, the local people should recommend changes and rearrangements of equipment based on their knowledge of local conditions whenever, in their judgment, such changes will result in more efficient operation of the office.

The commodity in which the traffic engineer is chiefly interested, in fact, the one which concerns the telephone industry most, is the telephone call.

The total calls made by a group of telephone users takes on no particular or set pattern during the day. And, yet, the necessary facilities must be provided which will produce the grade of service, measured by approved standards, that will meet the service satisfaction set by the local subscriber. There must be sufficient facilities engineered into the job to care for his maximum demand.

In order to do a competent engineering job, some of the laws of probability must be called upon to help solve the problems. The commodity under study must be analyzed and its component parts combined with such mathematical laws as can be adapted to the situation.

The basic factors which govern calls, as they originate from a group of telephone users and with which traffic engineering will be involved are:

(1) The elapsed time each call will occupy the facility or will call for handling by an operator.

(2) The number of talking paths or operators that are available in one group to handle all the calls offered them.

(3) The efficiency of the group of paths or operators that handle the calls.

(4) The service capabilities for a given call load having certain characteristics as come under the three items above.

These factors combine in many ways and places along the connection train. The effect of such combinations is to produce a certain grade of service.

In addition to the factors itemized above, other characteristics of the calls must be known:

(1) At what intervals during the busy hour are they placed? Are they placed simultaneously? At regular intervals? At random?

(2) What happens when caller finds all paths busy? Does he hang up and abandon the call or can he wait and get a path when it becomes idle?

The holding time and work time vary among calls. The elapsed time of a call which occupies facilities during its life is called "Holding Time" (HT). When a call uses the services of an operator such time is called "work time."

The holding time is composed mostly of the length of user conversation, as it relates to the paths set up for that call. But it also includes:

(1) The time it takes for the equipment to travel the steps leading to completion.

(2) Should the call be routed via an operator the holding time will be augmented by the time used by the operator to advance the call and later to disconnect after the conversation is completed.

(Section 2 will be continued next week)

A New Red Book from the Newest Plant in the Industry

A New Plant

New Products

...and

A New

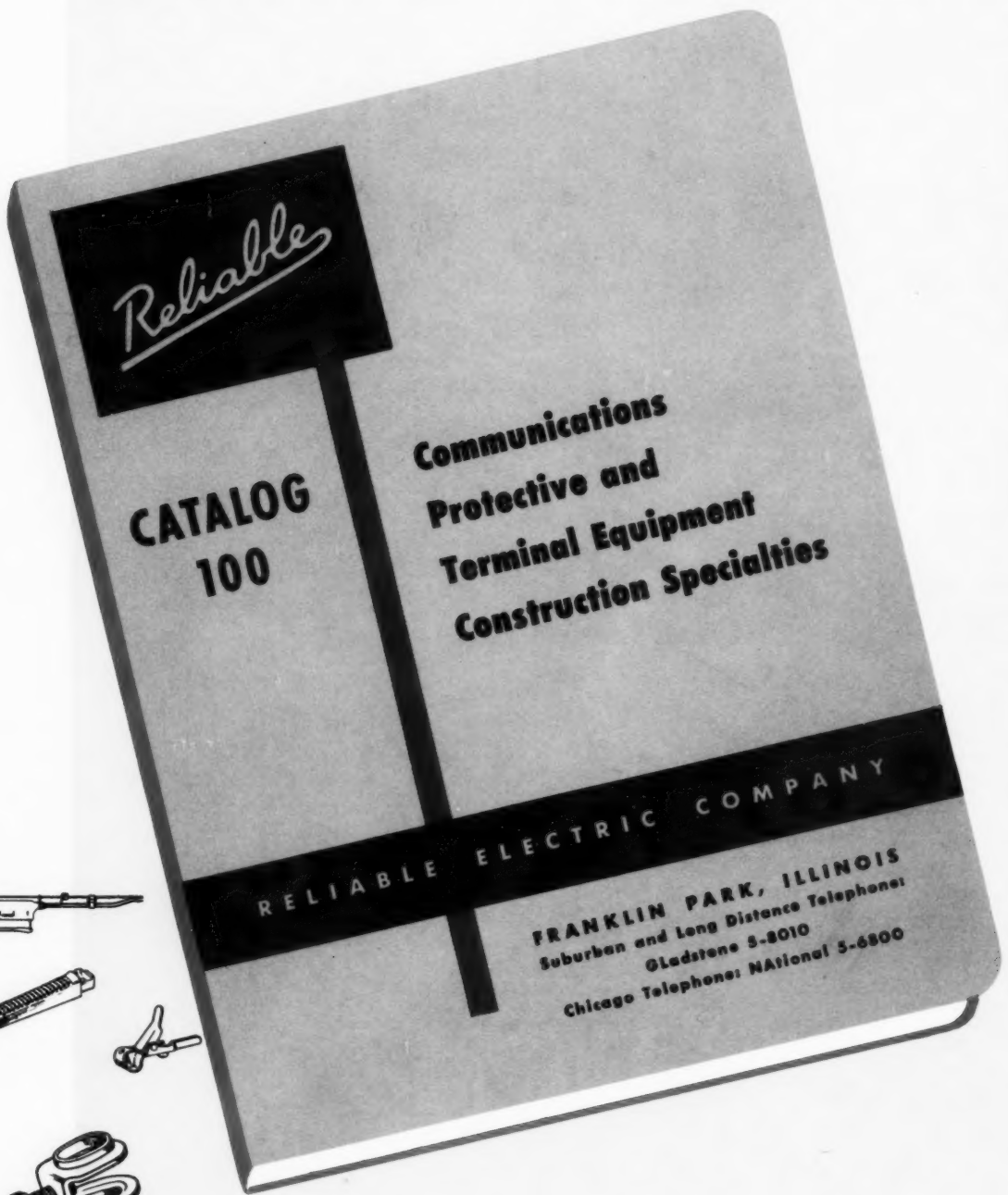
Catalog

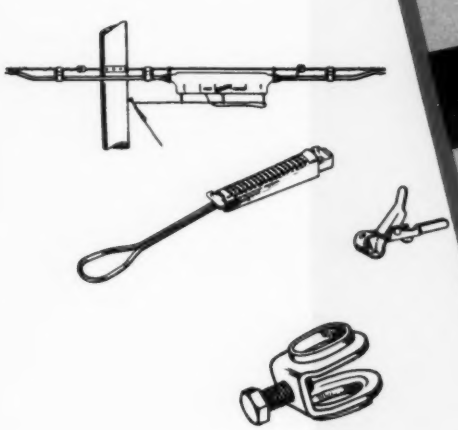
Designed to Be Useful:

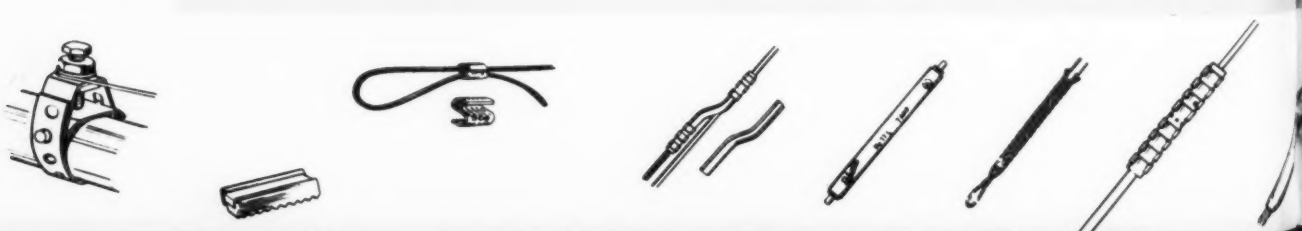
This new catalog places a great deal of information about Reliable's Communications Equipment right at your fingertips.

Products, Applications, Sizes, Sectional Drawings, Parts, Diagrams and Prices are all presented in a manner that gives you a clearer description of the products and their uses. Everything is carefully organized for quick reference. Indexes are both alphabetical and numerical.

This new Communications Catalog is now ready for distribution. The coupon on page 4 will bring it to you promptly.

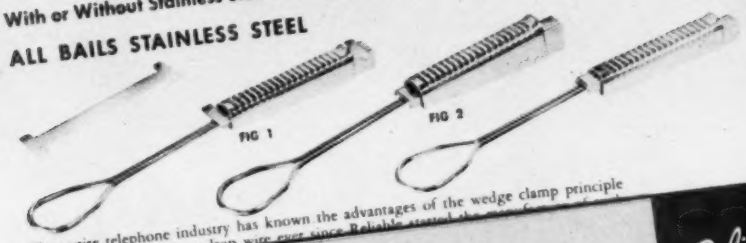






Reliable DROP WIRE CLAMPS and ACCESSORIES

STAINLESS STEEL and ALUMINUM
DROP WIRE CLAMPS
With or Without Stainless Steel Floating Type Shim
ALL BAILS STAINLESS STEEL



The entire telephone industry has known the advantages of the wedge clamp principle for supporting telephone drop wire ever since Reliable started the

Products and details are well illustrated.

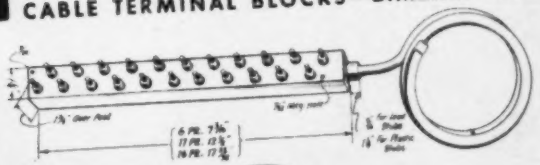
Reliable STRAND CABLE TERMINALS

This catalog is tionalized by typ product.

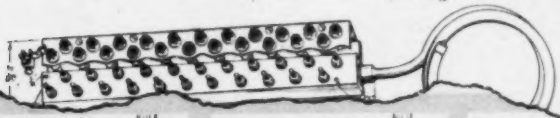
PROTECTED UNPROTECTED
TYPE ST CABLE TERMINALS

Reliable CABLE TERMINAL BLOCKS

TYPE ST
CABLE TERMINAL BLOCKS—DIMENSIONS



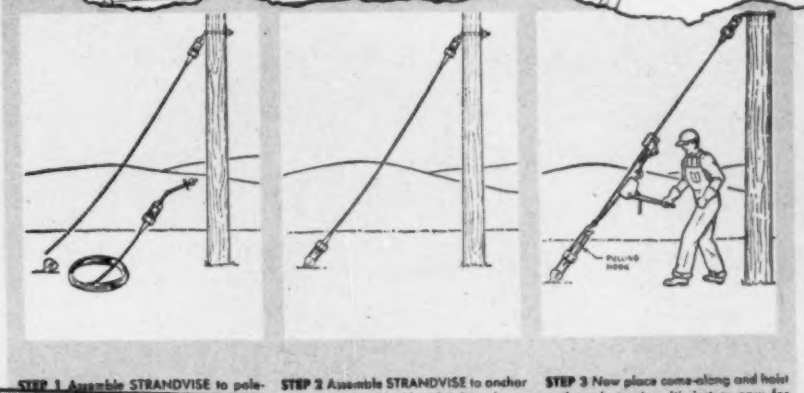
Unprotected—6, 11 and 16 pr.



Protected—6, 11 and 16 pr.

Types and Sizes are clearly cataloged for each product.

Recommended construction procedures are included here and there.



STEP 1 Assemble STRANDVISE to pole- STEP 2 Assemble STRANDVISE to anchor STEP 3 Now place come-along and hoist and apply tension. It's just as easy for

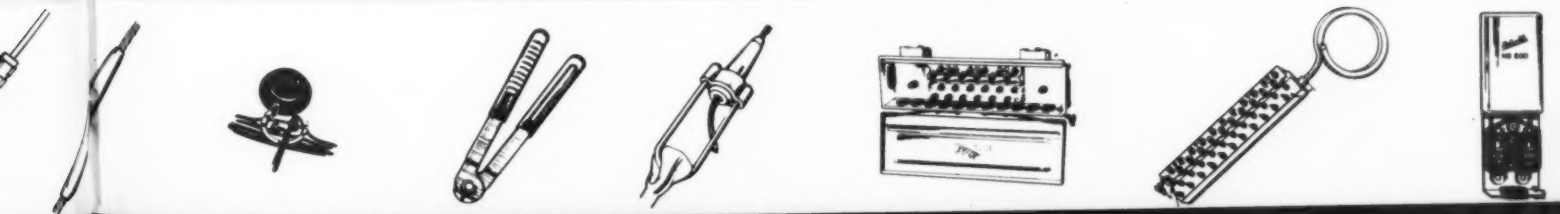
Reliable STATION PROTECTORS

THE 2000 SERIES STATION PROTECTOR
FORMER CATALOG SERIES 1000
RESTYLED AND IMPROVED

INSTALLATION IS UNUSUALLY SIMPLE AND NEAT

The catalog 2000 series Station Protectors afford numerous advantages. The high quality flexible neo-

There is a compl index — both alp betical and numeri



XUM

Reliable has made a 15 minute full color movie showing the manufacture, testing and uses of STRANDVISE.

Ask our District Representative or your Reliable Distributor to arrange a showing.

Reliable's New Home . . .

Reliable has served the Communications and Power Industries for a half century. These have been years of continuing progress. As the demand for Reliable's equipment grew, facilities were added to provide the necessary production. However, the time came when further expansion at the same site was impractical. So, now, Reliable has moved into a new, modern and larger plant with expanded engineering and production facilities. A standing invitation is extended to all of our friends, whenever in Chicago or vicinity—please call us and arrange to visit us.

MAIL THIS COUPON FOR RELIABLE'S NEW CATALOG 100

ELIABLE ELECTRIC COMPANY
1333 Addison Street
anklin Park, Illinois

es, please send my copy Catalog 100
(PLEASE TYPE OR PRINT)

ame.....

ompany.....

ddress.....

ity.....Zone.....State.....

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

RELIABLE ELECTRIC COMPANY
11333 Addison Street
Franklin Park, Illinois

Suburban and Long Distance Telephone:
GLadstone 5-8010

Chicago Telephone: NAtional 5-6800

Courts and Commissions

Bell Requests Higher Rates In Utah

A motion seeking increased rates for its Utah exchanges was filed by Mountain States Telephone & Telegraph Co. on Sept. 28 with the Utah Public Service Commission.

The company left to the decision of the commission the amount of any increase and the areas in which any increase would be put into effect.

The step reopened a case heard early last year. After the hearing, the company requested permission to reopen the case and to submit new evidence. The commission allowed the request on July 2, 1956 (TELEPHONY, July 14, 1956, p. 35).

Until Sept. 27, no action was taken and the rate increase filed remained open. Then, on Sept. 27, the company asked the commission to set a hearing date to accept testimony in the case.

In a letter explaining its move, the company noted that in the intervening period, it had made large capital outlays for new equipment, had expanded dial service, had granted wage increases to its employes, had established new depreciation rates and had arrived at figures indicating the need for a rate increase.

In the earlier hearing, the proposed increase was protested by a number of Utah cities.

Ohio Commission Approves Issuance of Bonds

The Ohio Public Utilities Commission recently took the following actions in connection with the issuance of securities and notes on the part of telephone companies:

The Arcadia Mutual Telephone Co., Inc. was authorized to issue its promissory note in the aggregate principal amount of $37,000 to Automatic Electric Sales, Corp., which is to be retired by monthly payments over a period of 6½ years.

The Lorain Telephone Co. received approval by the commission to issue and sell 40-Year 5 per cent Sinking Fund Debenture Bonds in the principal amount of $700,000. These bonds shall be sold at 102 per cent of the principal amount thereof. The proceeds from the sale of the bonds is to be used to reimburse the company's treasury in the amount of $605,332.64, and the remaining balance of the principal amount of said bonds shall be charged against capital expenditures made subsequent to Jan. 1, 1957.

The Northern Ohio Telephone Co. of Bellevue was authorized to issue and sell its 30-Year 5⅛ per cent First Mortgage Bonds in the amount of 3 million dollars. These bonds shall be sold at not less than 100 per cent of the principal amount. The proceeds of the bonds shall be used to reimburse the company's treasury for capital expenditures made therefrom.

General of Illinois Asks OK on Financing, Purchase

The Illinois Commerce Commission on Oct. 8 was to hear application for authority to General Telephone Co. of Illinois to issue and sell 21,090 shares of no par value common stock; to acquire 1,000 shares of no par value common stock of the Jerseyville Telephone Co., Inc.; to acquire the property, franchises and assets of the Jerseyville Telephone Co., Inc., in exchange for 1,000 shares of its no par value common stock. Also for a certificate to General of Illinois, to operate in the area heretofore served by the Jerseyville Telephone Co., Inc.

Ohio Independent Gets Rate Increase

The Ohio Public Utilities Commission recently authorized The Lykens Telephone Co. to increase its rates to an amount where the income available for fixed charges would be $2,073.51. This would amount to a rate of return 5.79 per cent on a rate base (reproduction cost new less depreciation), of $35,828.-26. Previously, the company's rate of return on this same rate base was 1.83 per cent.

Following is a listing of the old and new rates:

Business	*Old*	*New*
One-party	$3.50	$4.50
Multi-party	3.00	—
Ten-party	—	4.00
Residence		
One-party	$3.00	4.00
Multi-party	2.50	—
Ten-party	—	3.50
(Outside Base Rate Area)		
Business multi-party	$3.50	—
Business 10-party	—	4.50
Residence multi-party	2.50	—
Residence 10-party	—	3.50

Wisconsin Companies Ask Rate Raises, Purchase

The Wisconsin Public Service Commission on Oct. 10 was to hear the application of the Rudolph Telephone Co. and the Wood County Telephone Co. for authority to increase toll rates between Wisconsin Rapids and Rudolph, and of the latter company to increase paystation rates.

The commission also was scheduled to hear rate applications from the Kaukauna Telephone Co. and the Berlin Telephone Co. on Oct. 8, and of the West Kewaunee Western Telephone Co. on Oct. 9.

The commission on Oct. 8 was to hear the application of the Harmony Telephone Co. for authority to sell to Amberg Telephone & Telegraph Co.

Pacific T&T Authorized Raises on Idaho Operations

In authorizing on Oct. 4, $113,900 of increased revenues for the Idaho operations of Pacific Telephone & Telegraph Co., the Idaho Public Utilities Commission had the following to say about the approved rate of return:

"When The Pacific Telephone & Telegraph Co.'s annual operating income has been increased . . . it will then be earning a return of about 6.88 per cent, measured by a rate base which is the average for the 12 months ended Dec. 31, 1956, in the amount of $3,652,-862 (an average original cost figure plus a working capital allowance). This return will diminish so that it will be about 6.5 per cent or less, in 1957."

The commission's findings and reasoning on rate of return are represented by the following:

XUM

"The applicant (Pacific T&T) . . . has proposed increased rates that will produce a rate of return of 6.88 per cent on a rate base of $3,652,862 after recasting actual 1956 operations for all known changes. Projecting these results through 1957, the rate of earnings will be decreased to 6.34 per cent.

"In support of its requests, the applicant lays considerable stress upon the cost of money and produced an expert witness in this field in support of its conception of a fair rate of return.

"This witness introduced evidence that shows that the market yield on outstanding debt securities for public utilities with an Aa Moody's rating has increased from 3.05 in 1952 to 3.81 for the period ended Apr. 30, 1957, and that the cost of new bond issues to utilities had increased from a low of 3.19 per cent in 1952 to a high of 4.67 per cent to Apr. 30, 1957, or over one full percentage point or about ⅓ in cost since 1952.

"In 1952, the cost of new capital to the applicant, based on the then existing market condition and earnings level was 5.79 per cent. In 1956, based on these same conditions, the cost of new capital to the applicant has risen to 6.32 per cent.

"This is the cost of new capital and is the minimum cost to the applicant of obtaining new capital and does not reflect a fair return on the book capital already committed to the business.

"In this respect, the witness submitted evidence that shows the percent return on average total capital for 150 of the largest electric, gas and telephone utilities. This exhibit shows that for 1952, when this commission found 5.96 per cent to be a reasonable rate of return for the applicant, these utilities had a return of 5.99 per cent and for 1956 these utilities were earning a return of 6.69 per cent.

"The applicant, in raising the amounts of new capital it needs, must compete with other businesses for the investor's dollar. In order to secure the required capital on reasonable terms, it must offer investors the opportunity for as good a return as they can secure from other investments of like risk.

"If the applicant cannot offer as good a return, then its credit position will deteriorate, and the future financing will become progressively more costly.

"As has been previously shown, based on the 1956 operating results, the proposed rates will produce a return of 6.88 per cent, and, forecasted for the year 1957, the return will decrease to 6.34 per cent, and if future operations conform to past results, the rate of return which the applicant will earn will be gradually reduced."

Two Indiana Companies Hold Joint Open House

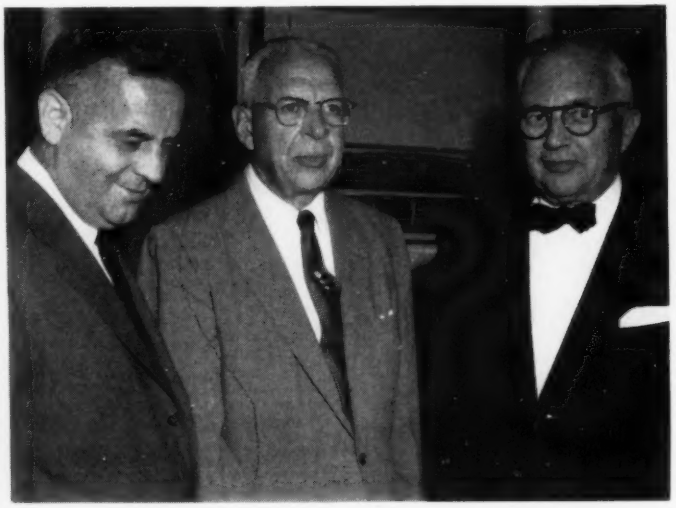
Two neighboring Indiana Independent telephone companies took advantage of "Independent Telephone Week" (Sept. 8 to 14) to sponsor a "joint" open house for industry leaders and the local public to celebrate the inauguration of dial telephone service.

The two companies—United Telephone Co. of Indiana and Rochester Telephone Co. Inc.—on Sept. 12 invited around 100 industry representatives from the midwest to United's Warsaw exchange and Rochester, to view the new Stromberg-Carlson XY dial equipment that previously had been cut into operation. The group spent the luncheon noon hour and the forepart of the afternoon at Rochester and then travelled to Warsaw for United's open house and dinner in the evening.

On Sept. 13 the Rochester company held a one-day open house for local citizens and the United company began a three-day open house for the general public.

The Rochester company also observed its 61st anniversary during the open house.

R. F. Lucier is president of the United Telephone Co. of Indiana and Hugh A. Barnhart is president of the Rochester Telephone Co.

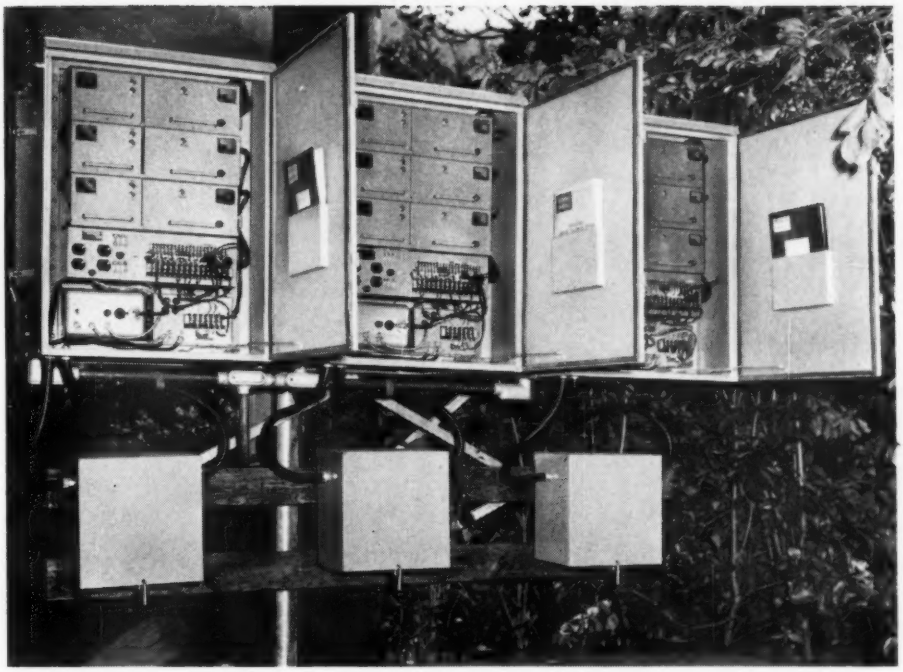


Groups photographed at joint open house held by United Telephone Co. of Indiana and Rochester (Ind.) Telephone Co. to celebrate "Independent Telephone Week."

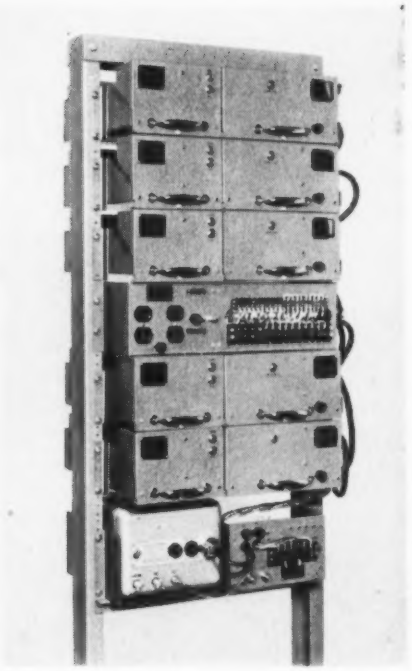
Upper left photo, left to right: Roy Echols, vice president of Indiana Bell Telephone Co.; R. F. Lucier, president of United Telephone Co.; R. C. Tait, president of Stromberg-Carlson Co., and Russell Hirschman, assistant vice president of Indiana Bell.

Upper right photo. Three officials of Rochester Telephone Co., left to right: Carlton Haskett, director; Hugh Barnhart, president, and T. D. Dial, director.

Left photo, left to right: W. J. Scheidler, president of Indiana Telephone Corp.; Francis Simpson, general manager of Eastern Indiana Telephone Co.; LaMar Stoops, vice president of Nappanee Telephone Co. and Roscoe Pontius, general manager of Rochester Telephone Co.



Lynch B-120 Subscriber Carrier equipment can be mounted in a Central Office 19-inch relay rack or in a Lynch A-48 weather-proof pole-mounted box.



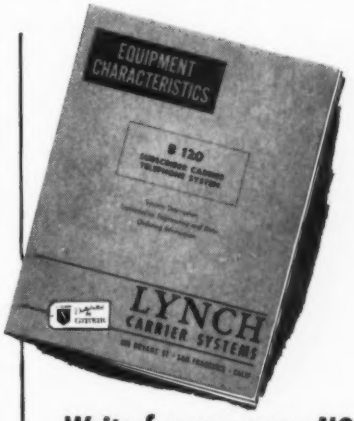
The Lynch B-120 is a carrier system which provides an economical means for increasing the capacity of a party line.

How to put more subscribers on existing lines . . . via Graybar

You can provide one to five individual carrier telephone channels with the new Lynch B-120 subscriber carrier telephone system—available from Graybar. You can superimpose all five channels on a telephone pair that may be carrying ten-party subscriber service. Each channel, working as a separate entity, complete with signalling, operates without interference with other channels or existing subscriber circuits.

You gain these 4 important advantages when you install the Lynch B-120:

1) Lower crosstalk levels; 2) lower operating frequencies; 3) more circuits on the same pole line or in the same entrance cable; 4) usable with any type of ringing system now in common use. For catalog and price information, plus seasoned help on any phase of carrier operation—call Graybar. Add our years of experience in telephony to yours and the toughest problems will get sound solutions—fast. 765-2310



Write for your copy NOW!

"Equipment Characteristics" is a 74-page manual carrying a complete description of Lynch Carrier Systems, with a wealth of transmission engineering information and data. Write Graybar for a copy today. It will be mailed,—no charge or obligation.

Call Graybar first for...

GRAYBAR ELECTRIC CO., INC.
420 Lexington Avenue
New York 17, N. Y.

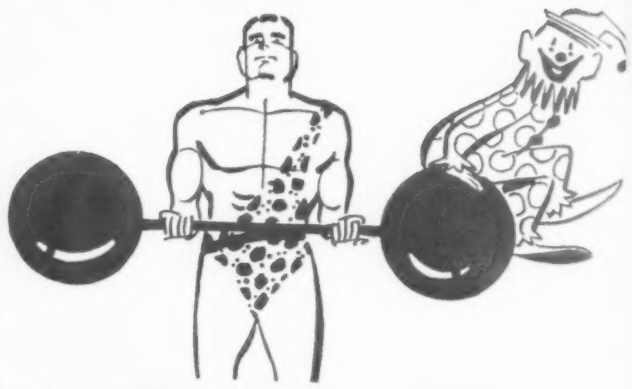
Graybar Quality — Everything Electrical

IN OVER 130 PRINCIPAL CITIES

"Step right up, ladies and gentlemen –

it's CARNIVAL TIME at the A

See wild animals from Darkest Africa!



Test your skill and strength in Thrilling Games!

the greatest COLLECTION of telephone equipment

and supplies EVER ASSEMBLED under the BIG TOP!

Automatic Electric Exhibits"

Let Swami tell Your Fortune!

See the Peep Show WOW!

U.S.I.T.A. CONVENTION

Conrad Hilton Hotel, Chicago

Oct. 14, 15 & 16, 1957

TENT 504, 505, 507, 509 & 602

AUTOMATIC AE CD® ELECTRIC

A member of the General Telephone System — One of America s great communications systems

GENERAL SYSTEM

REA Makes Rural Telephone Loans of $2,915,000 in Six States

Seven loans totaling $2,915,000 to improve and extend rural telephone service in six states were approved the week of Sept. 22 by the Rural Electrification Administration.

More than 1,400 rural subscribers in Kansas, Mississippi, North Dakota, Oklahoma, South Carolina, and Texas will receive initial telephone service. Others will benefit from improved service.

Hughes Telephone Co., Bailey, Miss.; $543,000, first loan (Sept. 23).

The loan will finance improved service for 405 rural subscribers and initial service for 418 farm families and other rural establishments now without telephones.

The present Obadiah central office will be replaced with a new automatic office building with space for commercial office facilities. A new automatic office building, with garage and workshop facilities, will be constructed at DeKalb.

Harry N. Lackey is manager of Hughes Telephone Co. Yerby Lee Hughes, Beaumont, Tex., is president.

•

Cross Telephone Co., Warner, Okla.; $237,000, third loan (Sept. 24).

The borrower will use these funds to serve an additional 367 rural subscribers, including 138 without telephones and 229 receiving magneto service.

To furnish this added service, the Cross Company plans to acquire the Porum Telephone Co. at Porum. The acquired facilities will be converted to automatic operation, and a new automatic central office constructed at Porum.

The present and previous loans, amounting to $594,000, will enable the borrower to offer new and improved service to 1,138 rural subscribers. The system will consist of five exchanges of which Gore, Warner and Webber Falls are in operation. Keota is scheduled for cutover to dial by the end of 1957. At present, the borrower is furnishing dial service to approximately 475 subscribers.

E. K. Cross is the president of Cross Telephone Co. George Johnson is manager.

•

Citizens Telephone Co., Lexington, S. C.; $417,000, fourth loan (Sept. 24).

This loan will enable the borrower to furnish modern dial service to 833 subscribers.

Purchase of a site and construction of warehouse and garage facilities in Lexington also are scheduled under the loan.

At present, Citizens Telephone Co. furnishes dial service to about 1,400 subscribers. With the present and prior loans, which total $724,000, it plans to serve 2,183 subscribers.

Sam A. George is president and manager of Citizens Telephone Co.

•

Southern Kansas Telephone Co., Inc., Burden, Kan.; $840,000, first loan (Sept. 27).

The new borrower will improve service for 1,362 present subscribers and furnish initial service for an additional 673 farm families. At present, Southern Kansas Telephone Co. has automatic exchanges at Clearwater, Dexter and Viola, and magneto exchanges at Atlanta, Burden, Cambridge, Grenola and Latham.

New automatic central offices are scheduled at Atlanta, Burden, Cambridge and Latham. The Grenola building will be remodeled for continued use as an automatic office and the Clearwater, Dexter and Viola automatic offices will continue to serve the expanded system.

A portion of the loan will refinance indebtedness incurred by the borrower in converting three of its exchanges to dial operation.

Mrs. Dorothy E. Mikesell is president of Southern Kansas Telephone Co. and E. B. Mikesell is manager.

•

Reservation Mutual Aid Telephone Corp., Parshall, N. D.; $385,000 loan (Sept. 27).

The loan will finance improved service for 222 existing rural subscribers and initial service for 87 farm families. The borrower plans to acquire, rehabilitate and integrate properties of the Farmers Telephone Co. at Arnegard, and the Lewis Mutual Telephone Co. at Norma. These facilities now provide magneto service. New automatic central offices will replace magneto facilities.

Mobile radio-telephone service for the system, which will also be available for commercial organizations in the Keene and Newtown areas, also will be installed under the loan.

The present and previous REA loans, totaling $2,478,000, will enable the borrower to offer new and improved service to 2,925 subscribers, eight of which are switched by Northwestern Bell at Watford City. The system consists of 12 exchanges. The Keene, Newtown and Roseglen exchanges are in operation; exchanges at Emmet-Garrison, Makoti, Parshall, Plaza, Ross, Ryder and Spencer are scheduled for cutover by the end of this year.

Donnell Haugen is president of Reservation Mutual Aid Telephone Corp. and Fred W. Ahlgren is manager.

•

Central Oklahoma Telephone Co., Davenport, Okla.; $312,000, second loan (Sept. 27).

The loan will finance new and improved service for 567 rural subscribers. Since approval of the first loan in 1954, Central Oklahoma Telephone Co. has acquired the Agra Telephone Exchange, the Sparks Telephone Co., and the Tryon Telephone Co., providing magneto service to 285 subscribers. These acquisitions were financed mainly by the borrower from general funds. A portion of the present loan will be used for interim financing in connection with acquisition of the Tryon property.

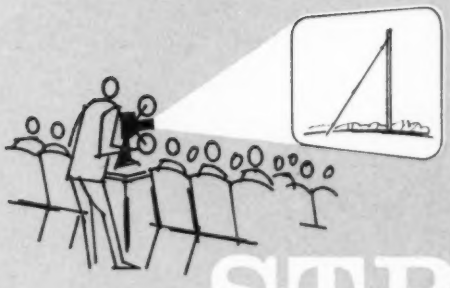
New automatic offices will be constructed to replace the present facilities at Agra, Sparks and Tryon.

(Please turn to page 46)

XUM

The Reliable Electric Company

invites you to see and hear



"THE STRANDVISE STORY"

a fifteen minute sound-color film showing
the manufacture, testing and uses of Strandvise.
Your Reliable representative or
distributor will arrange a showing.

RELIABLE ELECTRIC COMPANY

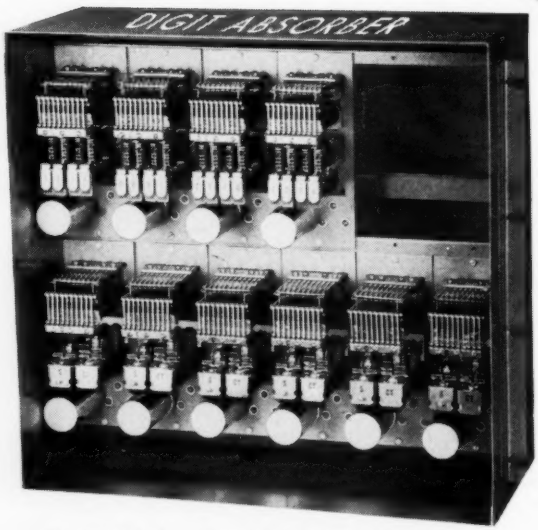
FRANKLIN PARK, ILLINOIS

Reliable

60 YEARS OF INDEPENDENT TELEPHONY 1897-1957

Can your Switchboard handle

2-5 DISTANT DIALING?



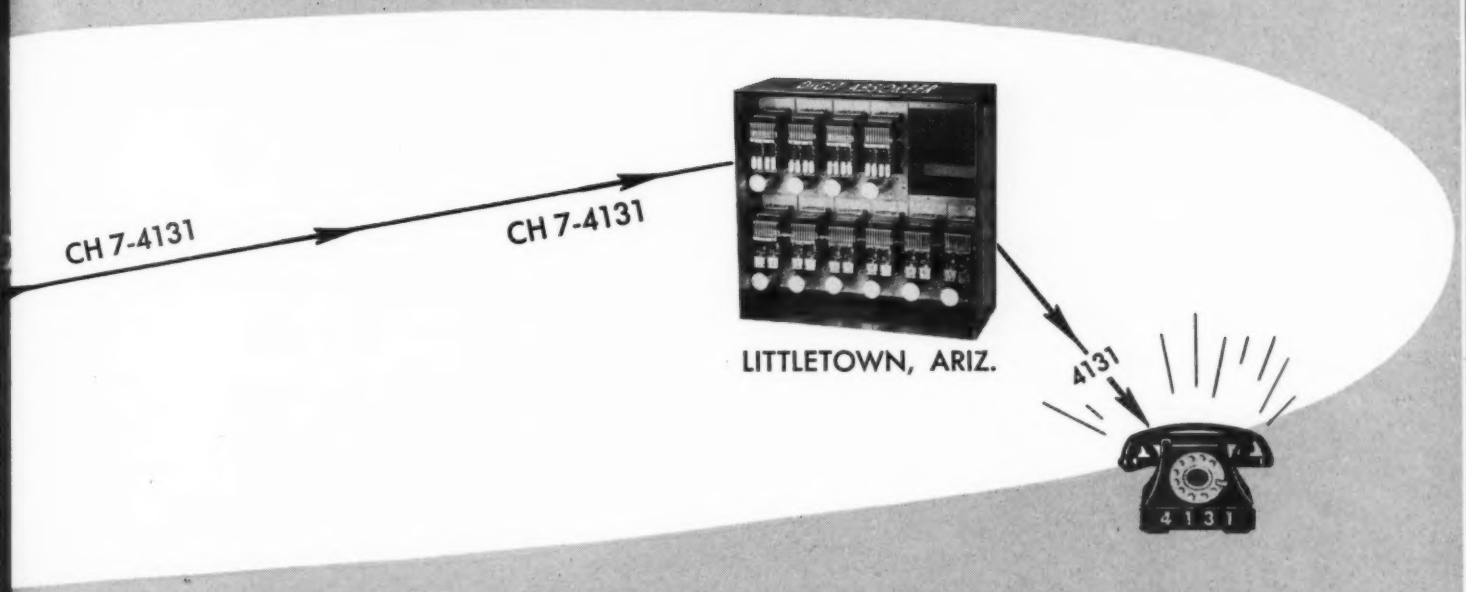
Typical Relay Case for Digit Absorber.

The Universal Digit Absorber employs simple circuity with a magnetic impulse counter, together with other standard relay apparatus of recognized manufacture.

Other UNIVERSAL Telephone Equipment:
Code-to-Selective RINGING CONVERTER
COMPUTER INTERCEPT

INDEPENDENT

It can with a UNIVERSAL DIGIT ABSORBER*



DIRECT DISTANCE DIALING REQUIRES A 2-5 CODE

The nationwide dialing plans for operator and direct distance dialing require that all stations be recognized by a 2-5 code. Few dial switchboards of earlier design have provisions for adding digit absorbing features economically. The Universal Digit Absorber fills this need easily and at nominal cost. Installation requires very little time.

The ever-increasing requirements of Extended Scope Dialing on a universal numbering arrangement are easily handled by the Universal Digit Absorber. The Digit Absorber is a factory assembled, fully-wired, applique unit that can be added to any existing dial switchboard to pad in three digits of exchange code (ABX) or four digits in the case of a small digit dial unit.

There are two types of Universal Digit Absorbers, depending on the complexity of the exchange codes assigned:

*19-S unit will handle exchange codes, as illustrated by AB-X, where the "X" digit is not a duplicate of the "A" or "B" digit.

*19-L unit is required where the "X" digit is a repeat of either the "A" or "B" digit.

In addition, Universal offers a Trunk Digit Register unit which can be applied to "Trunk on Line" dial units where five or more digits are required to be delivered to a 3 or a 4 digit tributary exchange.

*Pat. Pend.

TELEPHONE DIVISION

UNIVERSAL
CONTROLS CORPORATION
OFFICE AND PLANT – CARROLLTON, TEXAS
MAIL ADDRESS – P. O. BOX 13122, DALLAS 20, TEXAS

KELLOGG
A DIVISION OF
IT&T
6650 S. CICERO, CHICAGO 38, ILLINOIS

SALES OFFICES

6000 W. 51ST. ST.
CHICAGO 38, ILL.

1515 TURTLE CREEK BLVD.
DALLAS 7, TEXAS

4501 TRUMAN ROAD
KANSAS CITY 1, MO.

1555 WEST FOURTH STREET
MANSFIELD, OHIO

23 BRODERICK ROAD
BURLINGAME, CALIF.

1594 SOUTHLAND CIRCLE, N. W.
ATLANTA, GA.

410 N. SYNDICATE AVE.
ST. PAUL 4, MINN.

165 PROSPECT STREET
PASSAIC, N. J.

Mail this coupon to the nearest address.

Gentlemen: I am interested in your Universal *Digit Absorber* for 2-5 Numbering.

Name_____

Firm_____

Address_____

City_____ State_____

T-10-12

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

Superior's

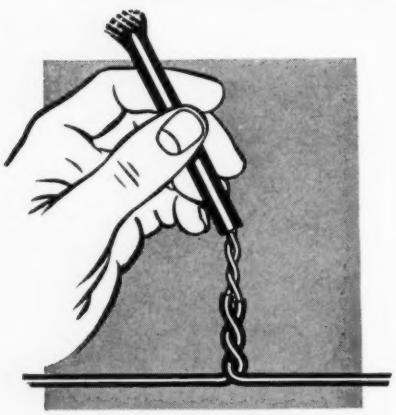
"Super-Splice"®

is

safe

and

sure!



"Super-Splice" makes splices waterproof . . . from inside out!

Sealed at one end, this plastic splice sleeve is filled with an insulating and waterproofing compound.*

Economical "Super-Splice," a Superior exclusive, makes the splice permanently as good as the cable . . . yet it can be re-entered easily. The compound never hardens or oozes out no matter what the temperature.

Prevent leakage currents and breakdowns in the presence of moisture...good for 25,000 v.d.c. Order "Super-Splice" NOW!

*A Dow-Corning silicone compound.

An REA Standard.

"Super-Splice" is available for use with straight, butt or bridge splices.

For further information on economical "SUPER-SPLICE", write

SUPERIOR CABLE

SUPERIOR CABLE CORPORATION
Hickory, North Carolina

The borrower's two REA loans, amounting to $494,000, will make possible new and improved service to 1,036 rural subscribers. The completed system will consist of five exchanges, including those at Davenport and Kendrick which are serving approximately 400 subscribers.

L. A. Guest is president and manager of Central Oklahoma Telephone Co.

•

Texas-Midland Telephone Co., 10353 Denton Drive, Dallas, Tex.; $181,000, second loan (Sept. 27).

This loan will finance improved service for 157 existing subscribers and initial service for 139 rural families now without telephones. These subscribers now receive magneto service from the Godley Telephone Co. The borrowers propose to acquire these Godley company facilities. A new automatic central office is scheduled to replace the Godley magneto switchboard.

The Godley properties are adjacent to the borrower's Acton exchange.

The present and a prior REA loan, amounting to $373,000, will also enable the Texas-Midland company to provide new and improved service for 694 subscribers. The expanded system will consist of exchanges at Acton, Godley and Kopperl.

C. J. Wimer is president and manager of Texas-Midland Telephone Co.

IN THE NATION'S CAPITAL

Concluded from page 22

money? The answer seems to be "no" —very politely and tactfully—with reference to special telephone hearing aid devices—but still NO!

This writer has tried two types of special hearing aid telephones and gave up on them. Nothing like the old detachable receiver of years ago, which was perfectly workable and didn't cost anything extra on the telephone bill. As a matter of fact, it would seem more logical for the hearing aid people to put a special telephone device on the aid instead of having it on the telephone. Then, the aid wearer could use it no matter whatever telephone he used. Surprise! The hearing aid people thought of that years ago, and put just a special switch on their aids. Another surprise! They don't work. At least this writer, who has had two different aids so equipped, has never been able to get them to work.

Several months ago a Detroit auto tycoon pooh-poohed the 80,000 sales last year of a certain foreign made car which looks like an ad out of a 1935 magazine. "Shucks," he said, "we *mislay* more new cars than that every year. Well, this year that same little droopy-tailed, bevel-snout foreigner is likely to ring up 200,000 car sales in the United States. We don't hear any more such laughing in Detroit on this subject. Instead, we hear guarded hints about plans for a light cheap *American* model, to meet such competition.

Could this happen in the telephone business? Probably not, but there's no harm asking once in a while, and maybe double checking on those good old scientific infallible customer surveys. By the way, whatever happened to the old four-wheel drive Cord? And where can a fellow buy a good button hook?

Safety Thumb Tacks
By John A. Bracken

Bits of safety reasoning, either pointed or flat, depending upon the way you look at them:

"SAFETY constantly practiced—is the best insurance policy ever written."

•

"For greater SAFETY—correct unsafe conditions met with each day."

•

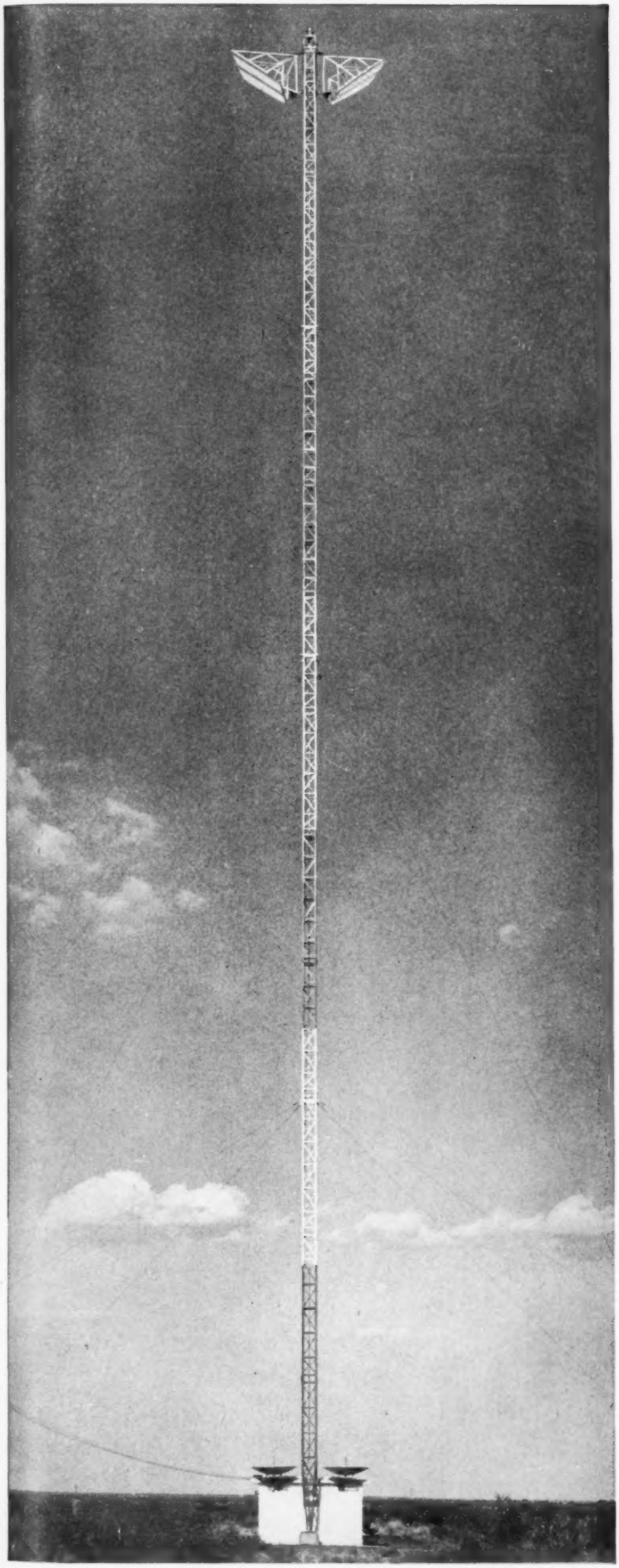
"When danger is near, fellow workers should be warned. They may know all about it—if not, a life may be saved."

•

"First line of defense against accidents—keep SAFETY guard up."

•

"On all jobs—plan the SAFETY details first."



your specific needs

for television microwave are met by the most complete and most widely used portable and rack-mounted equipment in the industry for color with audio transmission—*Raytheon KTR relays.**

KTR-100—0.1 watt for 6, 7, and 13 Kmc bands.

KTR-1000—standard 1.0 watt for 6 and 7 Kmc bands.

KTR-1000G—deluxe 1.0 watt for 6 and 7 Kmc bands.

Complete technical data on request.

Please write to *Raytheon Manufacturing Co., Commercial Equipment Division, Dept. 6120R, Waltham 54, Massachusetts*

RAYTHEON *Excellence in Electronics*

A-3020 *NOW IN USE IN MORE THAN 350 INSTALLATIONS.

construction and maintenance DIGEST

- **Insure your power**
- **On the inside**
- **For the country**
- **A lasting wire**
- **3 ways better**

Published regularly to help you get the most out of your materials and supplies dollar

by C. J. Reynolds, Stromberg-Carlson Company

Two dividends are yours when you order supplies from Stromberg-Carlson. First, you get the protection of a double guarantee—ours and the maker's. This assures you of getting the finest products, backed by our 63-year reputation. Second, your support is used to further the art of telephony. We're knee-deep in this industry as a full-time job, not a side line, and your supply business plays a big part and helps us continue our research for new and better telephone equipment.

Insure your power supply

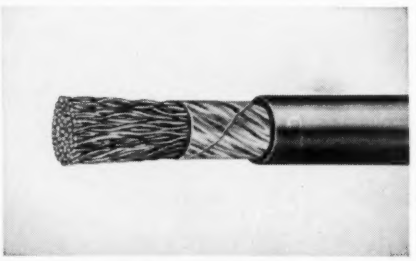
Because Planté batteries practically last forever...providing stand-by power that never fails...they're the best operating insurance you can buy. In switchgear, signal and alarm systems, or emergency light and power applications, these lead batteries have rolled up amazing performance records . . . are famous for their ability to deliver a powerful surge or a steady flow of current the instant it's needed. Make sure you're in operation . . . always. Choose Gould Planté.

A sure, dependable supply of power when you need it. That, briefly, is the story of this Gould Planté battery.

Long life . . . low cost

To meet your needs for inside wiring cable, Whitney Blake Company offers Inside "Telecable"—multiconductor paired—with semi-rigid insulation – brown or ivory Plastite jacket. Available in 24 A.W.G. soft bare copper conductors up to 76 pairs and 22 A.W.G. up to 51 pairs.

This inside wiring cable gives long service life because: it is water-resistant; has high resistance to crushing; is unaffected by humidity. The semi-rigid Plastite insulation has far greater compression strength than regular polyvinyl chloride compounds. The resulting long life of the cable means much lower maintenance costs.



Semi-rigid Plastite insulation

Inside "Telecable" is light in weight and easy to install. To terminate conductors, simply strip insulation and then solder.

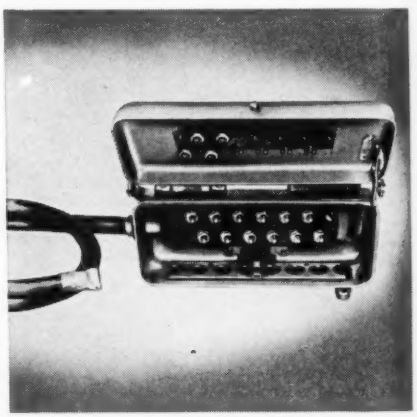
The insulation is permanently colored for lasting polarity identification.

Cable terminal for rural areas

Cook Electric Company's 6-pair "Stranterm" cable terminal is designed particularly for the limited distribution required in rural areas.

Rugged construction, ease of installation, convenience in servicing and maintenance-free operation are some of the advantages you get with the Cook "Stranterm."

This terminal can be installed unprotected and be protected later on a pair-by-pair basis with Cook Minigap or Mytigap Arresters. It is available with a 3½-foot 24-gauge cable stub of lead or plastic-sheathed cable.



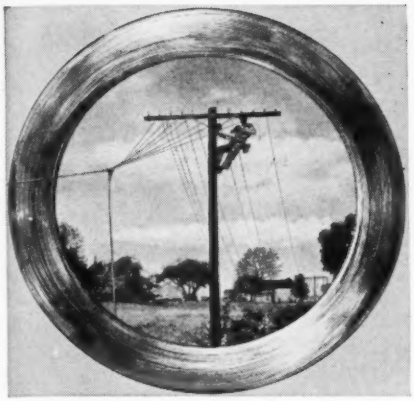
Cook 6-pair "Stranterm" cable terminal.

The "Stranterm" cable terminal is compact, light in weight, and very convenient for connecting or changing drops.

This top performer brings you low-budget operation

If you'd like to reduce the cost of installing and maintaining telephone lines, may we suggest a rugged wire that staunchly defies wind, ice, and snow?

Copperweld Telephone Line Wire is known as a faithful friend, having wonderful transmission qualities and long, rust-resisting life. It lasts and lasts and lasts—saves you maintenance or replacement costs.



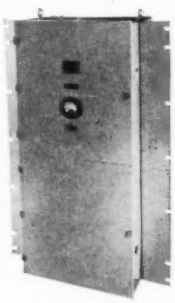
Copperweld Line Wire "talks better," and cuts your maintenance costs.

For short subscriber loops and secondary toll lines, we recommend .080"-30 E.H.S. and for toll lines and long subscriber loops, .104"-40 H.S.

Order Copperweld from your Stromberg-Carlson representative.

Raytheon Rectichargers® Battery Chargers—Complete Line 3-400 Amperes

Entirely redesigned new Raytheon Rectichargers offer three major improvements:



New Raytheon battery chargers feature ± 1% no-load to full-load regulation

1. ± 1% no-load to full-load stabilization prevents battery overcharging, minimizes gassing, lengthens battery life.
2. No audible hum at output terminals.
3. Most compact units on the market—wall or rack mounted.

Automatically compensated for rectifier aging, Rectichargers offer high efficiency, completely automatic regulation. No moving parts and self-protecting circuitry assure minimum maintenance, long life. Single and three phase, 3-400 amps.

Built by Raytheon, supplied to you by your Stromberg-Carlson representative.

Distributed by

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

DESIGN AND OPERATION OF SMALL COMPANIES

Continued from page 25

The determination of the estimated load for the urban area is not as difficult as that for the rural plant since, in most cases, the majority of the streets have been established and the resulting blocks and additions are plotted in lots. However, in those instances where excessive residence building is being experienced in locations within the corporate limits of the community and beyond it, much study should be given to the possible customer demand for new and additional telephone service.

The fact that a community has experienced only limited growth for some years in the past does not mean that that condition will continue. Many civic bodies and similar organizations in the smaller towns are putting forth plans and inducements to get manufacturing concerns to locate in their communities.

The telephone company's ability to supply adequate service will have a direct bearing on whether or not manufacturers can carry on their business in the area. If they do, it will also mean additional residence service for any of their employes moving to the town along with local residents who might be employed by the manufacturers.

A city block, depending on its location, with residences which have depreciated to a point where they are not suitable in accordance with present-day living standards, could change to an apartment house, office building, a parking lot, or a super market. These points are brought out to illustrate the change which could occur in telephone requirements for a given location and which could greatly affect the company's ability to supply the service.

Many additional possibilities exist whereby the demands for telephone service could change considerably from those which have been experienced in the past, and here the local telephone personnel are in a position to anticipate the customer possibilities by considering the inquiries which have been or may be made in connection with regarding from four-party to two-party or single line service.

If considerable regrading is encountered at the time of the cut-over to automatic operation or thereafter which was not anticipated, an otherwise well laid out survey can be ruined. It can affect not only the outside plant but also the central office equipment and, in some cases, the size of the central office building.

In assembling the customer possibilities for the urban area, both within the corporate limits and any urban residential locations outside of it, a map should be secured which will show all streets and blocks. It is advisable to show the lots on this map, since a large majority of them will be a possible telephone location and practically every village and city today has a plat map of this kind, although some of them have not been brought up to date.

In those cases, and where a suitable plat map is not available, an abstracter's office in the county seat usually has sufficient data so that one can be prepared. The records of the commu-

The demand for telephone service in outlying areas can change rapidly, as sub-divisions are planned.

nity land surveyor would also be of considerable help.

The size of the available maps may not be satisfactory, in which case it will be necessary to have one prepared so that it will cover the exchange requirements for the survey purposes and can also be used to show the ultimate cable plant.

Fig. 2 shows a section of such a map, with the streets, blocks and lots in proportion. It should be noted that the scale used in preparing this map is considerably larger than the 2 inches per mile used for the rural area, which is necessary in order to show the additional information required for record purposes, both for the customer potential survey and the ultimately constructed plant.

With that assumption in mind, it is suggested that a map be drawn that does not exceed 3 feet in length and width, with the entire urban area shown thereon, but with at least a one-half mile of rural territory beyond the corporate limits. If additional space is needed, it should be drawn in sections since the additional size will make it difficult to handle, both in the office and in the field.

The figures shown in each block in *Fig. 2* represent the circuits to the central office needed to supply service in that block. The bottom figure (5) in Block No. 1 indicates the actual circuits in service at the time of the survey and may be made up of one single line, two two-party lines, and two four-party lines or whatever the case might be.

The second figure from the bottom (8) represents the lines or circuits which will be in use at the time the new plant is cut into service after the rebuilding work has been completed. As shown in other blocks on the map, the second figure from the bottom can be smaller than the bottom one because of regrouping on party lines so that customers on the same line will, as far as possible, be located within the same block.

The third and fourth figures (from the bottom) represent the circuit requirements five and 10 years after the cut-over to the new plant. For information purposes, it is advisable to project the requirements beyond the 10-year period for as long as it is anticipated that the main parts of the plant, such as the central office building, switchboard, and feeder cables, will remain in service before they have to be enlarged, or are replaced because of age.

It is evident that additional data not shown on the map, consisting of the actual number of customers in each block who have, or will have, service of the various grades, such as single, two and four-party, be secured in order that the circuit requirements can be established.

Each section of the exchange area which is to be fed by one or more cables from the same office feeder cable should be blocked off in order to be able to determine the cable pairs necessary to feed that urban section, along with those necessary for the rural area circuits which will occupy the same cable.

The tabulation of all of those urban sections, along with the rural circuit requirements feeding through them, will supply the data to determine the size of all branch and main feeder cable from the main frame. In setting up the final tabulation, a number of additional factors should be considered.

Many companies are now considering, or are actually supplying, service to adjacent exchanges without toll billing. The facilities used for this purpose need not be of the grade ordinarily used for toll purposes, and can be classed as short-haul business.

The customers' psychological reaction in cases of this kind is that they feel they are getting more for their money and, while all the telephone customers will not take advantage of this additional service, it should have a bearing on requests for additional service which might not be made if the service is limited to one exchange.

A similar reaction usually occurs when the rehabilitation plan covers the conversion to automatic operation, in that the customers feel they are getting the same type of service as that given in the large cities. The residents of smaller communities today have the majority of the conveniences enjoyed by large city people, but, in many of them, their telephones are of the "crank" type so that the conversion to automatic operation usually increases the demand for new service.

Conversely, some customers will object to being deprived of the "secretarial" service supplied by the operator in the smaller exchanges after they are converted to automatic operation. These objections will be very limited and will have little or no effect on the final customer tabulation.

Another Tangent

"This country was founded on the principle there should be no taxation without representation. We are now in a good way for revolt against taxation without limitations."—T. COLEMAN ANDREWS, *former commissioner, Internal Revenue Service.*

Lincoln T&T Asks Approval On Dialaphone Rates in Neb.

The Lincoln Telephone & Telegraph Co. on Sept. 30 asked permission of the Nebraska Railway Commission to provide automatic push button dialing in connection with all dial telephones.

The company proposes to furnish Dialaphone equipment which provides an indexed directory tape on which a maximum of 850 telephone numbers may be punched. The subscriber selects the party desired on the indexed tape and presses a starting key. The Dialaphone then completes the call automatically, thus saving time and providing greater accuracy in dialing.

The proposed monthly rate is $5.00 with an installation charge of $5.00 and an inside move charge of $1.00.

Southern Bell Purchases N. C. Independent

Southern Bell Telephone & Telegraph Co. took over the Pender Telephone Co. at Burgaw, on Sept. 30, after purchasing the company with the approval of the North Carolina Utilities Commission (TELEPHONY, Apr. 6, p. 38).

A general improvement program has been announced, and the system eventually will be converted to automatic operation.

Minn. Independent to Buy Stations from Southeastern

The Minnesota Railroad & Warehouse Commission on Sept. 27 authorized the Southeastern Telephone Co., Fairmont, to sell certain properties in Scott and Le Sueur counties to the Eckles Telephone Co., Blue Earth.

The property involved has to do with rural lines of the Southeastern company, serving 69 stations, which are now being furnished switching service by the New Prague exchange of the Eckles company.

Two Nebraska Independents Request Approval on Rates

The Nebraska Railway Commission on Oct. 11 was scheduled to hear the application of Johnstown Telephone Co. for authority to increase rates.

The application of the Staplehurst Telephone Co. for authority to adjust rates was also to be considered on the same date.

Florida Company Asks Raise

The Florida Railroad & Public Utilities Commission on Nov. 18 is scheduled to hear the application of Orange City Telephone Co. Inc. for authority to raise its exchange rates in Orange City, Lake Helen and Cassadaga.

THE SUPERVISOR

Continued from page 27

man's intelligence builds up a feeling of importance and promotes job satisfaction.

Many things can promote a mental disturbance in an employe. Too frequent criticism, a feeling of inferiority, frustration, lack of praise for a good job, not being given an opportunity to make a decision or give suggestions, too strict discipline, unsatisfactory home life, poor health, inadequate social life or financial difficulties, all these and many more personal influences can affect the work of an employe.

The good leader gears his instruction to the learner's ability to absorb. It isn't fair to an employe to present new methods when he is having difficulty applying what he has already been taught.

There will be some employes who feel that the supervisor has favorites—a natural supposition. Most people do have favorites among their associates. One just cannot help liking some people more than others. Even so, a supervisor can head an organization and keep his people friendly. But he must act impartially when on the job. His attitude must be the same toward everyone and he should be particularly attentive toward those whom he finds it difficult to act friendly.

When a sincere effort is made to be fair to each workman under his supervision, even though he may slip occasionally, the leader will be forgiven because of his past record for impartial dealing.

Tactless Criticism

Tactless criticism by word or tone of voice will make a person angry. One sure way to earn an employe's animosity is to criticize him, "ball him out" before others. A workman will accept correction more readily from someone he respects, someone who not only sees his faults but recognizes his good points as well.

Supervision cannot be withdrawn if we are to get the job done, that is for sure. In all kinds of work, inspection takes place. Most workers realize they need help and seek and welcome it. New practices should be explained clearly and reasons given for their existence. Overlook the occasional slip and do not harp on petty, unimportant things.

Most employes look for praise. This is one of the most important tools a supervisor has to work with. Even the confirmed "crab" looks for and esteems

Here's the PITCH
for faster, more economical anchoring
CHANCE BLACKFOOT ANCHORS
Can be installed by machine to cut line construction costs
Here's a screw anchor that goes down fast and easy whether your line crews install it by hand or by machine. A king-size thimbleye on the Chance Blackfoot will accommodate a big turning bar for easy hand installation. And when you machine-install a Chance Blackfoot Anchor, you reduce installation time to a minimum—which means a big savings in time and money!
What about holding power? Dynamometer tests on a Chance 15 inch Blackfoot Screw Anchor showed no creep at 22,000 pounds!
SMALLER HUB
Smaller hubs on Chance Screw Anchors mean less friction—easier installation. Less earth is disturbed during installation. That's why the Blackfoot has greater holding power.
PITCH CONTROLLED
This accurately pitched, fast cutting blade really goes down fast. Every size anchor is individually "pitch controlled."
Man! that anchor comes down fast!
"ANCHORING" is the most complete guide to anchoring and guying ever developed. It shows how to choose the right anchor for every job—and how to install it *right*. Send for your copy!
CA56-8A
A·B·CHANCE CO·
CENTRALIA, MISSOURI

An 8-tier run of Soapstone OCT-O-DUCT provides a new telephone link down hard-rock Nob Hill to colorful Chinatown in San Francisco.

YOU CAN ACTUALLY SEE SOAPSTONE DUCT SAVE YOU MONEY

1. Trenchside delivery of Soapstone OCT-O-DUCT eliminates field inventory problems and makes certain your duct is at your job when you need it.
2. OCT-O-DUCT's convenient 4-foot lengths can be quickly installed by 2-men crews even in narrow and deep trenches.
3. OCT-O-DUCT's exclusive, flat-sided design eliminates the need for expensive interlayer spacers. Duct will not roll.
4. OCT-O-DUCT is connected in the trench with easy-to-apply circular couplings making possible fast, rhythmic, production-line installation.

The many time- and work-saving features of Soapstone OCT-O-DUCT and full information on the sizes, bends and accessories available from this 30-year-old Company are contained in our Catalog and Installation Manual. For your FREE copies, drop us a note on your letterhead.

SOAPSTONE DUCT COMPANY
3985 Beach Street, Oakland 8, California

Distributed in the West by
MAYDWELL & HARTZELL, INC.
SAN FRANCISCO, LOS ANGELES, SAN DIEGO, PHOENIX, PORTLAND, SEATTLE, SPOKANE

an occasional word of genuine praise and appreciation. People are supposed to do their work correctly and with as much dispatch as they are capable.

Why should they be patted on the back for doing so? Everyone needs to be encouraged if they are to persevere, stick to the job and do good work. It takes little time to compliment an employe but the rewards for doing so are many.

Supervisor Not Superior

Workmen dislike the supervisor who insists on governing all situations, the "bossy" supervisor who acts as though he "knows it all" and is not as liable to make mistakes as the person to whom he is talking. The title "Supervisor" does not make one superior to others. It simply delegates one as a partner to get the job done.

The ideas a supervisor wishes to get across to his people are conveyed largely through speech. When he is capable of selecting the right words needed to illustrate his meaning, there will seldom be a misunderstanding, time will be saved and more efficiency will result. Regardless of education, the ability to choose the right word, to speak good English can be had for little effort. Listening for a few minutes each day to those who speak well and by practicing their delivery until one is certain his speech is free from defect, is all that it takes.

A leader of men will give advice only when he knows the full story, what is involved, the worker's point of view and the results that should be expected. When information is given in strict confidence, the supervisor should weigh carefully the disposition of the knowledge. If it is something of vital interest to the management, every effort should be used to get the person's permission to pass it along. If consent is not granted, the information should be kept inviolate. Advice should not be given too freely on personal matters. A supervisor's job is to help his people solve on-the-job problems.

Must Inspire Cooperation

What is supervision and why is it so important? Personnel management or supervision is not merely the hiring of people. It goes much deeper than this. It is the process of selecting, training, motivating, appraising, rewarding and inspiring the workman so that he will skillfully, accurately, intelligently and enthusiastically produce a product or service of good quality, at a price acceptable to the customer, under wages and conditions satisfactory to the employe and producing a reasonable profit for the owners.

Competent people are needed; so are cooperative workmen who will work together as a team to accomplish the objective. Who is responsible for developing the workers so they will have these qualities? The leader—the supervisor, of course.

When one becomes a supervisor a certain amount of authority goes with the job. Successful supervision depends upon the leader using his authority in such a way as to earn the respect and good-will of his people. This can be done by developing the use of the "we" method. It offers many more possibilities of meeting the changed conditions employment is faced with today. Employes want to feel that they are needed, an essential part of their organization. Call it any name, it is merely a sense of importance.

An employe is sensitive to his supervisor's opinions. Fairness, helpfulness, sympathetic understanding and mutual confidence and respect are all needed for the successful administration of supervision. Employes are very much what the supervisor believes them to be. When a supervisor looks for the best in a workman, he usually finds the best.

Most people do not have to be told of an opinion; they are able to sense it. The kind of work an employe does is usually a reflection of his leader's opinions. This does not mean that a supervisor should do any pampering but it does mean fairness, good judgment, impartiality and showing an honest interest in each employe and the work he does.

Routines can be easily learned. All that it takes is study and perseverence. Knowing people, learning how to work with them successfully is not such an easy matter.

It might be expected that two workmen with the same education, the same instructions and training, and the same length of experience, would develop alike. But they don't and that is where the supervisor steps into the picture. His job is a combination of knowing the job and knowing his people.

Let me repeat, to be a successful leader, he must treat his people in a way that will make them not only want to do a good day-to-day job, but to put forth extra efforts to care for an emergency and get a lot of satisfaction out of their accomplishments.

One of the best ways for a workman to learn is by asking questions. It shows confidence in the person to whom the question is directed. This holds good for the supervisor also. One of the functions of management is to help the supervisor carry on his duties efficiently and in the easiest, most pleasant way. The supervisor

should never hesitate to ask questions of management. They will be pleased, just as he is pleased when his workmen show their confidence in him by asking for his assistance.

The job of being a leader is an important one. Experience, imagination, understanding and an urge that comes from the heart will help him reach the goal where his people will say, "He is a good supervisor!"

Loeffler to Head National Salary Survey Committee

David S. Loeffler, of Ohio Bell Telephone Co., has been named national chairman of the 1957-58 salary survey committee of the National Office Management Association.

D. S. LOEFFLER

The appointment was announced by Frank G. MacIlroy, NOMA's international president.

This 17,000-member association of operating management executives seeks to better management through the improvement of standards and techniques in the office.

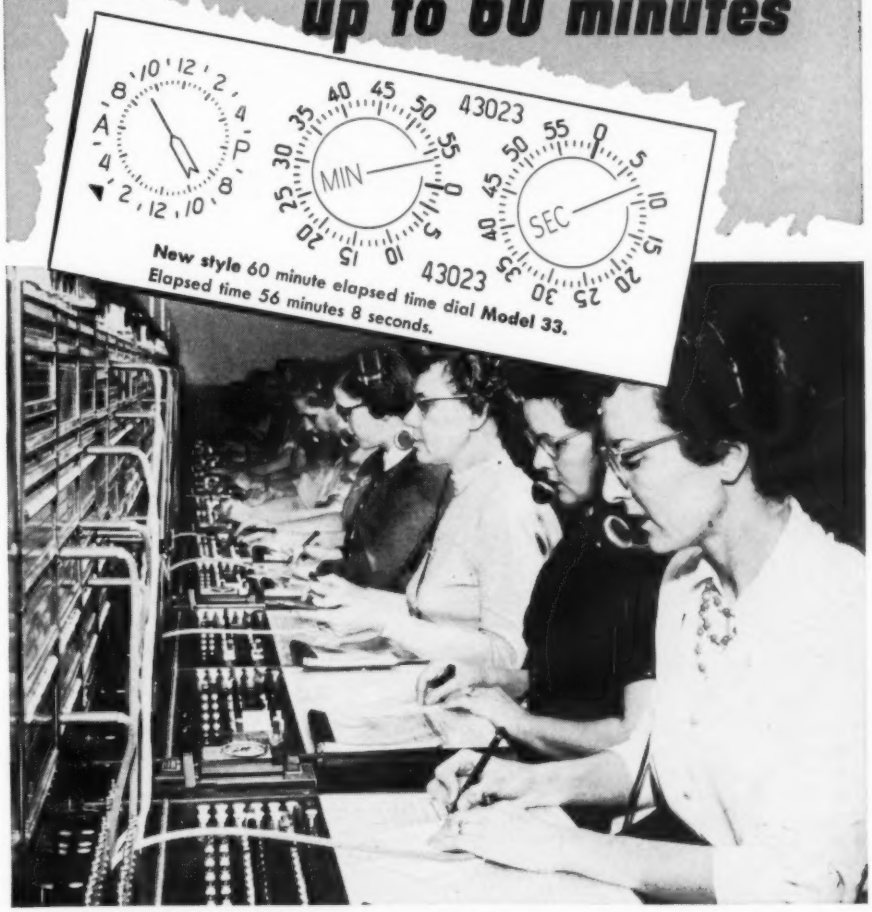
Association headquarters are at 1931 Old York Road, Willow Grove, Pa.

The Fatal Flaw

"The value of the Hoover Commission's reports, apart from the great volume of detail concerning our government made available in the task force papers, is that they call attention to the astonishing fact that a nation which is prime in industrial and agricultural efficiency, is incapable of efficiency in government. Our administration is costly, duplicative, wasteful, and hard on citizens. It rarely performs its functions as capably as private business does."—GEORGE E. SOKOLSKY, *columnist.*

CALCULAGRAPH

Now Automatically gives you accurate Toll Call Records— up to 60 minutes



New style 60 minute elapsed time dial Model 33. Elapsed time 56 minutes 8 seconds.

Photo courtesy of the General Telephone Company of Michigan

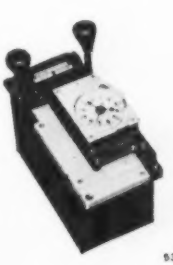
Now, Calculagraph, the modern dependable computer, automatically figures and prints toll calls up to 60 minutes —no need to add 30 minutes on long conversations.

Thus, Calculagraph adds one more feature to reduce human errors by busy operators and increases the volume of calls handled per operator. Assures you of all revenue due on every call.

For accurate toll call records, for automatic computation of elapsed time, for more efficient operation, install the new 60-minute elapsed time Calculagraph on your switchboard.

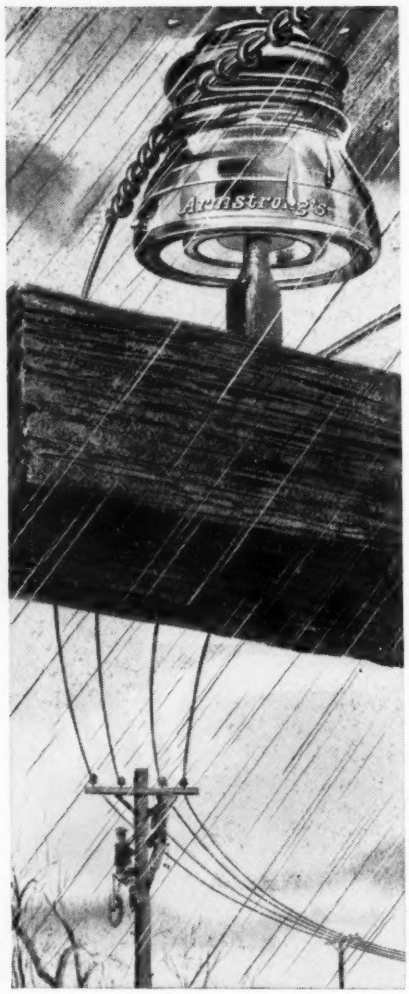
Information on this new Calculagraph is yours upon request.

Write today for illustrated brochure to Dept. T.



CALCULAGRAPH Company
HARRISON, N. J.

DEPENDABLE ELAPSED TIME COMPUTERS SINCE 1892



Minimum Leakage

The smooth surface and flat seams of Armstrong Glass Insulators keep surface leakage to a minimum. They permit the rain to readily wash the surface of the insulator clean . . . and prevent dirt and moisture from accumulating. Rain or shine, you can look to Armstrong Insulators for dependable service. For full details about every model in the line, write to Armstrong Cork Company, 295 Fifth Ave., New York 16, N. Y.

Watch Armstrong Circle Theatre every other Tuesday evening on NBC-TV

Armstrong
GLASS INSULATORS
for communications . . . for power

Southern Tech Establishes Its Telephone Technology Course

By R. N. EDWARDS*

IN MAY, 1957, TELEPHONY announced a proposed two-year course in telephone technology at the college level, to be offered by Southern Technical Institute. This was to be the nation's first college-degree course in telephony.

In less than three months Southern Tech received nearly 100 inquiries from the telephone industry and individuals interested in telephony. This rapid response should assure the success of the program.

Since the original announcement, the course has been approved and established. The first students enrolled on Sept. 23, and the college expects to graduate the first telephone technicians in June, 1959. They will be granted an Associate in Science degree in Electrical Technology (Telephony optional).

Like all Southern Tech programs, the telephony course was aimed at a specific target: Supplying the industry with employes who would earn their pay checks from the first day they worked. L. V. Johnson, director of Southern Technical Institute, is inviting members of the telephone industry and individuals to assist with their aid and suggestions to make this course of maximum benefit to the graduates and to the industry. Several manufacturers have already offered equipment for the telephony program, including a microwave installation.

Southern Tech, established in 1948, is a permanent, full-time, two-year coeducational boarding college and operates as a unit of the Engineering Extension Division of the Georgia Institute of Technology (Georgia Tech).

Southern Tech was already offering eight courses, all fully accredited by the Engineers' Council for Professional Development (ECPD): Building Construction Technology, Civil Technology, Electrical Technology, Electronics and Communications Technology, Gas Fuel Technology, Heating and Air-Conditioning Technology, Industrial Technology, and Mechanical Technology. Textile Technology was added this fall.

The telephone technology course is divided so that 62½ per cent of the student's time is spent in the classroom and 37½ per cent in the laboratory. The course provides (1) general training in English, human relations, supervisory training, technical writing, public speaking, business law, and economics; (2) general training in the technical sciences of mathematics and

*Mr. Edwards is an instructor in the Electronics Department of Southern Technical Institute.

When West Iowa Telephone Co. cut over its Remsen exchange to dial on Sept. 5, F. W. Daubendiek, manager of the West Iowa company, and Mrs. Daubendiek celebrated the occasion by making a transatlantic call to his brother, a civil engineer in Gronau, Germany. The connection was made in less than five minutes. Remsen is the fifth exchange of the West Iowa group to be converted to dial service.

physics; (3) specific training in electrical circuits, instrumentation and test equipment, electrical drafting, telephone transmission lines, central office equipment, automatic toll equipment, installation, design and maintenance of telephone equipment, outside plant, carrier systems, radio and microwaves, utility accounting, surveying, mechanics and traffic analysis.

Since the course will provide training in the field of applied telephone engineering, applicants for the course must be high-school graduates whose credits includes two in algebra, one in geometry and four in English. Two credits in science are strongly recommended. The college offers non-credit remedial courses in math and physics to those who need additional background in these subjects. Other entrance requirements include scores from the mathematics and verbal sections of the College Entrance Examination Board's Scholastic Aptitude Test.

Those interested in applying for admission in the Telephone Technology course may obtain additional information by contacting Prof. W. P. Allen, Southern Technical Institute, Chamblee, Ga.

Members of the telephone industry who desire more information about the level and availability of graduates should contact the Placement Office of Southern Technical Institute, also located at Chamblee.

General of the SW Becomes 100% Dial in Louisiana

With the conversion of Springhill, La., to automatic operation on Sept. 15, General Telephone Co. of the Southwest became 100 per cent dial-operated in the state of Louisiana, according to G. Howard Briggs, the company's operating vice president, who was speaker at the dinner celebrating the occasion.

Concurrent with the conversion was the establishment of extended area service between Springhill and the exchanges of Sarepta and Shongaloo. The Cullen, La., exchange was eliminated at the time of the cut-over and is now served out of the Springhill exchange. Springhill became an unattended automatic office with headquarters in Minden, La. General serves eight exchanges in Louisiana with about 4,500 stations.

The conversion and establishment of EAS represents an expenditure of nearly $600,000 in this area by General of the Southwest.

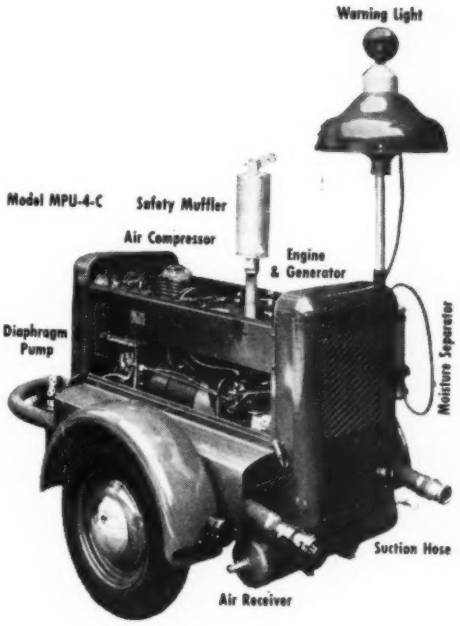
Springhill was the 182nd of General of the Southwest's 263 exchanges to be converted to automatic operation,

YOU CAN HAVE

S&G

A POWER AND PUMPING PLANT

THAT GOES ANYWHERE



MOBILE POWER UNIT

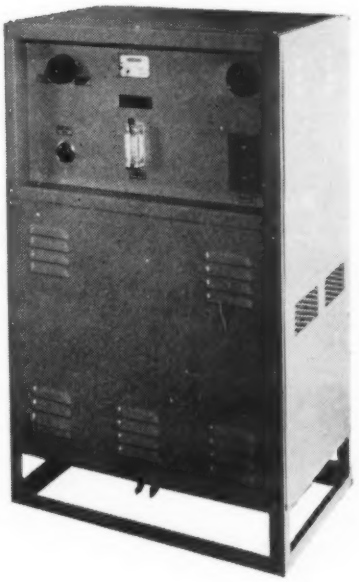
- Generator slow speed for quietness
- Pump—Diaphragm type to remove seepage and drain back
- Air Compressor — to put cables under pressure for cutovers or repairs

  Furnished with or without pump and compressor
- 300-Watt floodlight illuminates working area
- operates soldering pot and iron, electric and air tools
- electric blower to ventilate manhole
- supplies dry air for cable cutovers, flash testing, etc.
- diaphragm pump can be operated from manhole by push button control
- buzzer signal for summoning helper
- light, easy to handle

MODEL A Air Compressor Dehydrator

Exchange equipment designed to supply chemically dry air for telephone cables, aerial and underground, this unit can supply as many as 30 cables. The unit is equipped with volume recording air meter, high and low pressure alarm switches, humidstat and hour meter.

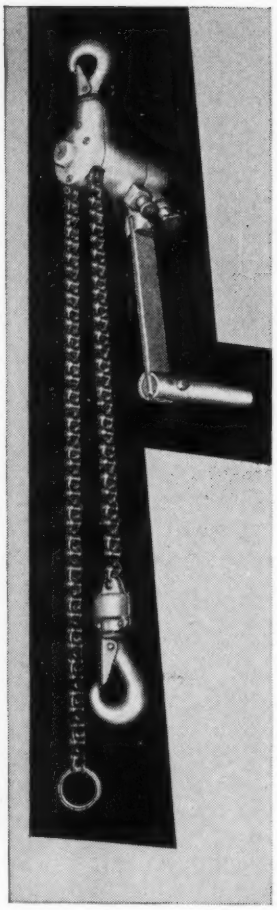
- Completely automatic in operation
- Air Purifier to eliminate oil mist
- Incorporates the latest safety devices



write or phone

S & G MANUFACTURING CORPORATION
P. O. Box 1309 • New Orleans 10, La. • RAymond 3142

XUM



The 9½ pound Coffing Mighty Midget Puller Lifts 1000 POUNDS

Lightweight and compact Coffing Mighty Midget Pullers are handy lifting tools for all kinds of operations in plants and in the field. The 1000-lb. capacity models weigh but 9½ lbs., and will lift the full load with only 40 pounds of handle pull. The 500-lb. model weighs 6½ lbs., and 28 pounds of handle pull lifts the capacity load.

On both models the handle can be used as a crank for fast lifting, or as a lever for working in cramped quarters. Should the puller be overloaded, the "safety valve" handle will give before any load-bearing part fails.

For full information on these sturdy pullers, consult your distributor or write to us for Bulletin MP. **Coffing Hoist Division, Duff-Norton Company, 808 Walter Street, Danville, Illinois.**

TAKE A BIG STEP TOWARD SAFETY WITH DUO-SAFETY LADDERS

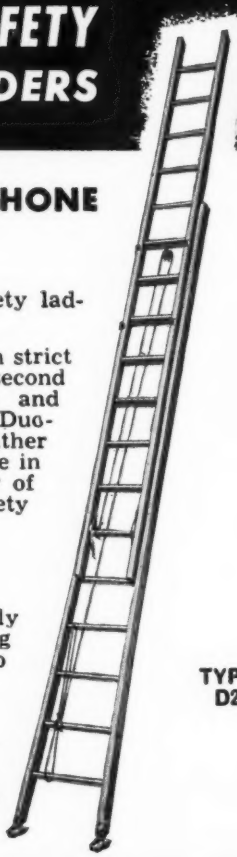
... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!



TYPE D2

For Information, Contact Your Supply House, or

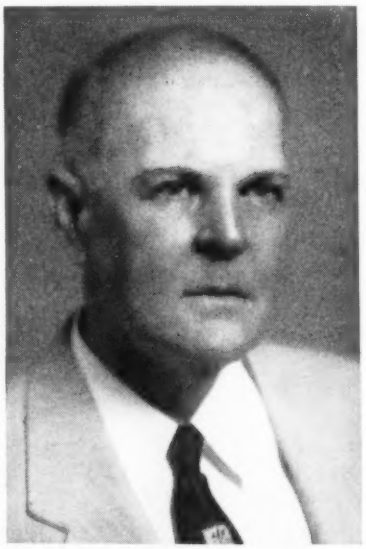
DUO-SAFETY LADDER CORP.
809 Ninth Street • Oshkosh, Wisconsin

and its conversion brings the percentage of dial telephones to about 80 per cent of the company's over 250,000 telephones in Texas, Louisiana, Arkansas, Oklahoma, and New Mexico.

J. K. O'Shaughnessy Retires from REA

J. K. O'Shaughnessy, assistant administrator for telephony, Rural Electrification Administration, retired on Sept. 27 after 20 years with the agency.

He joined the REA staff as a field engineer in 1937. In 1946 he was made chief of REA's engineering division,



J. K. O'SHAUGHNESSY

and for the next seven years was in charge of the engineering and construction program for getting electricity to America's farms. This involved more than 1.5 billion dollars in loan funds which REA borrowers used to reach 2.5 million rural consumers.

In June 1953 he was named chief of REA's telephone engineering division, and in September of that year was appointed assistant administrator in charge of REA's telephone program.

In 1954, he was presented the Department of Agriculture's Distinguished Service Award. The citation was made for "outstanding service to agriculture and rural life by making electric service available to many additional farms, through significant economies in constructing rural electric lines," and for "outstanding skill in public administration."

The detailed description of Mr. O'Shaughnessy's achievement which nominated him for the award, cited his part in holding down construction costs in the rural electric field.

Mr. O'Shaughnessy was born in New Orleans, La., in September 1887 and was graduated from the University of

Louisiana with a degree in electrical engineering. His successor has not been named.

General Conducts Research On Four Michigan Farms

T. A. Saunders, president of General Telephone Co. of Michigan, has announced that his company is presently conducting a 12-month farm research project which will provide complete urban telephone service for four Michigan farms.

Four farms in the southwestern Michigan area have been selected for the research project and equipment installations are nearly completed. Mr. Saunders stated that the farms were selected in cooperation with local county agricultural agents and the farm families. Each farm is specialized, representing dairying, fruit, grain or poultry production.

In commenting on the rural research plan, Mr. Saunders said:

"We want to learn all we can about the present and future telephone requirements of farm families. To do this, we will equip each farm with telephone communication equipment which will include extension telephones in the home and service buildings, outside telephone bells, special 'hands free' instruments, inter-communication sets and any other special features which might be required. The telephone instruments will be colored, wherever practical, and two of the farms will be furnished with private line service, even though multi-party service in rural areas is the rule at present."

He further stated that the owners of the experimental farms will not be charged for any of the special service features, but continue being billed for their regular service. The objective of the plan, Mr. Saunders said, "is to find out whether the farm people of Michigan can utilize telephone equipment which is generally found in urban areas, and also if our service development engineers need to include major facility changes in future plans for rural areas."

N. Y. Bell's Keith McHugh Named "Man of the Year"

Keith S. McHugh, president of the New York Telephone Co., was named "Man of the Year" on Sept. 22 by the 308 companies and organizations making up New York City's Hundred Year Association.

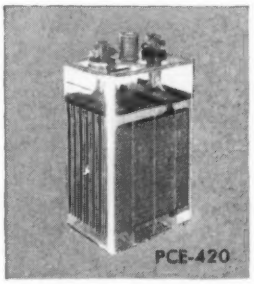
Mr. McHugh is president of the Community Service Society, active in the Greater New York Fund and the New York Convention and Visitors Bureau. He is a member of the New York State Defense Council and the Mayor's Subcommittee on Civil Defense

Telephone batteries engineered for—

25

years of service

C & D PlastiCal®



If you want extra-long life from batteries in telephone service—be sure to specify C & D PlastiCal® batteries.

Here is the original lead-calcium telephone battery that provides at least 40% longer life than conventional telephone batteries. With C & D PlastiCal telephone batteries you get:

- **Reduced maintenance**—Electrolyte level can be checked at a glance; cells require 1/5 as much water as conventional batteries.
- **Lower in-place cost**—Rugged one-piece plastic case is 20% lighter than glass; reduces shipping and breakage costs.
- **Increased safety**—C & D's patented Saftee-Vent eliminates the chance of accidental explosions; serves as funnel for filling.

These plus many other benefits mean that in the telephone field, C & D is—

Your better battery buy!

Literature available

Write for complete description and specifications in C & D PlastiCal Bulletin T-528.

C&D BATTERIES, INC.

of Conshohocken, Pa.

SINCE 1906

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

XUM

FOR SAFEST! FASTEST! SUREST!
"LIVE" WIRE CUTTING!
— use the

HKP®
PORTER
COHARDITE
ELECTRIC WIRE
CUTTER

1st Choice of most
UTILITY COMPANIES

— because PORTER COHARDITE-INSULATED ELECTRIC WIRE CUTTERS are built to meet the exacting safety and work-speed demands of Utility men. Center cut jaws easily cut insulated soft to medium hard wires, copper wire and medium hard steel wires up to ½". Rugged, hot-molded, special semi-hard rubber (Cohardite) handles, assure top toughness, high dielectric strength — and resist oxidation and chemicals. Each tool factory-tested to 20,000 volts.

and for STEEL CABLE & WIRE ROPE
use the TN
STEEL CABLE CUTTER!

Shear-action cutter — for general cutting of all soft or hard steel cable or wire rope up to ¾". Notched jaws lock cable during cut, minimizing deforming.

For COPPER and ALUMINUM CABLE
use the 2CN
SPECIAL SHEAR CABLE CUTTER

Designed for cutting soft, non-steel power cables, insulated or not, up to 1⅜" O.D. Jaws pass each other for clean cutting. A must for every efficient utility crew.

WRITE
for folder showing many other needed utility company cutting tools.

HKP®
H. K. PORTER, Inc.
Somerville 43, Mass.

for New York City. For the past two years he has been, at the request of the city, chairman of the Citizens Committee to Keep New York City Clean.

Citizens Utilities Company Awards Scholarship

Robert H. Welsh of Greenville, Cal, recently received the fourth Citizens Utilities—Joseph C. Briggs Memorial Scholarship Award in the amount of $500. Presentation was made by D. H. Steele, general manager of Citizens' California telephone operations. Robert's father, Harry E. Welsh, is a combination man in charge of the Greenville telephone exchange.

The award is the fourth in an annual program recently established by Citizens Utilities Co. as part of a program of financial assistance to high school graduates desiring to pursue education at higher levels. The scholarship award

STATEMENT OF OWNERSHIP

Statement required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233), showing the ownership, management and circulation of TELEPHONY, published weekly at Chicago, Ill., for October 1, 1956.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Telephony Publishing Corp., 608 S. Dearborn St., Chicago 5, Ill.; editor, R. C. Reno, 608 S. Dearborn St., Chicago 5, Ill.; managing editor, Dan S. Fargo, 608 S. Dearborn St., Chicago 5, Ill., and business manager, H. D. Fargo, Jr., 608 S. Dearborn St., Chicago 5, Ill.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as those of each individual member, must be given.)

Telephony Publishing Corp., 608 S. Dearborn St., Chicago 5, Ill.; H. D. Fargo, Jr., 608 S. Dearborn St., Chicago 5, Ill.; R. C. Reno, 608 S. Dearborn St., Chicago 5, Ill.; A. J. Stults, 608 S. Dearborn St., Chicago 5, Ill., and Dan S. Fargo, 608 S. Dearborn St., Chicago 5, Ill.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: 10,912.

R. C. RENO.

Sworn to and subscribed before me this 20th day of September, 1957.

ALBERT J. STULTS.
(My commission expires November 13, 1960.)

ONLY PANCAKE® OVERFLOOR DUCT SYSTEMS GIVE YOU THESE ADVANTAGES

1 No fittings are attached to office furniture — desks are not marred and are free to move to new locations at any time.

2 Lowest ramp angle and flattest overall height — to provide the most trip-proof raceway, and smoother movement of equipment on wheels.

3 The raceway is capable of carrying greater weights *without losing the mechanical grip* between base and cover.

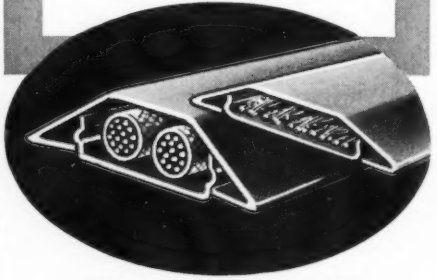
4 Raceway cover fits positively over base—a definite "snap" indicates that the cover is secure, without any doubt.

5 Twistouts in fitting covers conform to the raceway — there are no unsightly gaps that collect dust and grime.

6 Fitting covers are easier to line up and attach, because screws are fastened *vertically* to *threaded bushings* in base.

7 Raceway base and cover *both* fit snugly into fittings — a positive stop for each assures no slipping at any time.

8 Bases and covers for raceways and fittings are made of galvanized steel — for maximum resistance to corrosion.



Write for NEW Data Sheet H7
THE WIREMOLD® COMPANY
HARTFORD 10, CONNECTICUT

Robert H. Welsh (right) of Greenville, Cal., receiving fourth scholarship award of Citizens Utilities Co. from D. H. Steele, Citizens' California general manager.

culminates a nationwide competition among children, grandchildren, brothers and sisters of employes of Citizens Utilities Co. Citizens operates electric, gas, water and telephone properties serving more than 200 communities in seven states: Arizona, California, Colorado, Idaho, Illinois, Maine and Vermont.

The scholarship was established as a memorial to the former administrative vice president who met an untimely death in an automobile accident in 1951. Each year an award is made in the amount of $500. It results from voluntary contributions of more than 25 employes associated with the company and a contribution by the company. The award is made on the basis of scholastic record, recommendations of school authorities and community leaders and a brief competitive examination given all applicants.

In addition to the award, Citizens Utilities Co. will make summer employment available to Mr. Welsh at the end of his first year at college. This on-the-job training will supplement academic training and will help scholarship students finance their subsequent years of education.

In announcing the award, Richard L. Rosenthal, president of Citizens Utilities Co. stated: "This program has been designed to assist those children of our Citizens Utilities' family whose secondary school records demonstrate that they deserve and can utilize the benefits of higher education . . . The award is part of our effort to make a continuing contribution to the American tradition: Opportunity for ability and reward for endeavor—regardless of origin or creed."

Robert H. Welsh, the scholarship recipient, intends to major in Civil Engineering at the Chico State College at Chico, Cal.

Unique Gift Idea Promotes Reduction in Cable Damage

An advertising specialty distributed to construction companies solved an acute problem for the Bell Telephone Co. in Canada recently.

The problem was that construction men sometimes damaged underground telephone cables during excavation work. The obvious solution was to encourage builders and contractors to check first with Bell before work got underway on a project.

An advertising specialty was chosen to carry the message in the form of a deluxe pocket money-folder with the imprint, "Dial 114 before digging or drilling." The item, distributed to construction firms, proved successful, reports *Marketing*, and the goodwill created by the personal usefulness of the gift was an additional merit.

Government to Sell Telephone Companies

In line with the policy to halt government competition with private business, the Defense Department has authorized the sale of 124 telephone systems owned by the military, according to the United States Independent Telephone Association.

About a dozen of these are located in Independent territory. These companies have been notified by the USITA of the projected disposal of the now government-owned communications systems. Final action, of course, is dependent upon the completion of satisfactory negotiations between the parties concerned.

Freedom For All

"All special charters of freedom must be abrogated where the universal law of freedom is to flourish."—HEINE.

HERE'S YOUR PARTY

Robert R. Oman

It's a pleasure to connect you to Bob Oman, Manager of Kellogg's Chicago Division. Bob is typical of the people you talk to when you call your Kellogg branch. He is a veteran telephone man . . . spent 18 years in the operating end of the business . . . knows telephone equipment backward and forward.

KELLOGG
A DIVISION OF I T & T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
A Division of International Telephone and Telegraph Corp.
6650 S. Cicero Ave., Chicago 38, Ill.
Telephone: POrtsmouth 7-6900

Bashlin's Quality

FOR OVER 30 YEARS
Choice of Experienced Linemen

FULL FLOATING
SHIFTING DEE
BODY BELT . . .

Bashlin Quality again is outstanding in this "safety first" body belt. Comfortable, with tools in easy reach . . . Doubly Safe because Bashlin Body Belts have the additional Nylon Safety Feature.

The Bashlin Quality Line of Linemen's Safety Equipment is complete . . . Buy the best from a manufacturer with Long Proven Experience.

You Can't Afford Anything LESS Than the BEST—
Buy BASHLIN
Highest Quality For Over 30 Years
Distributors in Strategic Areas in U.S.A.

EXPORT: Copperweld Steel International Co.
IN CANADA: A. B. Chance Co. of Canada Ltd., Toronto

Ask for . . .
CATALOG NO. 156

W. M. BASHLIN CO.
GROVE CITY, PA.

American Businessmen Should Cultivate the Art of Listening

"HEAR OUT, BEFORE YOU attempt to answer," said William Penn in America's early days. And within the limits of man's endurance, listening is one of the activities the ambitious businessman ought to be more than willing to adopt.

How else, amid today's complexities and swift changes of trend and pace, can any man—from top executive to engineer to salesman, from veteran office or factory worker to the veriest beginner—hear enough to keep abreast of his duties and responsibilities? Indeed, if he is to make progress, to lead his company, to gain a desired promotion or even to hang on to his job, he must learn to listen with active intelligence.

Listening may seem to many as something to be taken for granted. We are told as children, "Listen to me when I speak to you!" We reply that we *are* listening, but often we are not and our attention is centered elsewhere on something of seemingly more immediate importance.

As we grew, how well did we learn to listen? Have we learned that listening is a cultivated skill—that this skill must be wooed with patience, self-discipline, and a profound interest in others?

Think of the really big men, the successful businessmen. Common to virtually all of them is a marked ability to listen. There is nothing passive, nothing spongelike nor halfhearted about their listening.

The top executive, the ace salesman, and every man really good at his work sorts out what is being said—sifts out what is important to his need. He listens with understanding and makes his interest evident so that the speaker will talk his best. He listens with an open mind, willing and ready to absorb new ideas and re-evaluate old and accepted habits. He appraises the speaker and forms judgments as he listens.

Alert and intelligent listening will help a man to grow and increase his potentialities. Many of the best and newest ideas come as a result of what a person hears and retains. However big the position a man holds, he must often listen to the words and ideas of men who know more about the subject under discussion than does he. In order to make competent decisions he must get to know all the facts.

But facts do *not* speak for themselves; the listener must exercise critical evaluation of them. Perhaps the speaker is motivated by prejudices and biases in varying degrees. These in their turn must be weighed along with his words.

A good listener must always be able to hear criticism without heat or rancor and, if the criticism is just, to benefit by it. He must have an ear for overtones and hidden meanings. He must cultivate his listening powers to such a high degree of sensitivity that he can sift out new trends, both major and minor, from the mass of facts and opinions that come to his ears.

The truly accomplished listener is the man at the top—for he is the man who is wiser and more knowledgeable than his fellow workers. He is the man who knows that knowledge and wisdom are not something that can be poured as from a pitcher into a glass. He knows that knowledge and wisdom from the spoken word become an individual's special possession only when he listens, evaluates, and makes them his own.

The active listener knows that he shows strength, not weakness, when something he hears leads him to recognize an error and reverse a decision.

Because he is constantly searching for enlightenment he can trust, the man at the top keeps his mind open, flexible, and responsive, for he knows that new ideas spring from unlikely as well as promising sources.

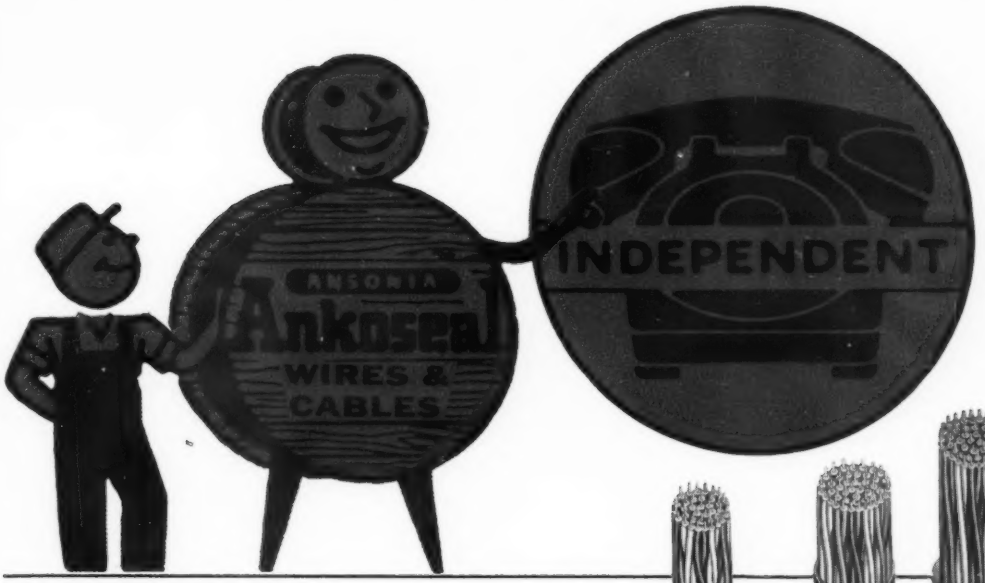
The good listener makes himself a focal point for dependable information. Based upon his own experience, he challenges what he is told in order to arrive at a thoughtful and sure analysis. He is, in short, on top of his job —a man of responsibility.

There is great need for such men—many more of such men—in America and the world today, men who will "hear out" before they attempt to answer. As much if not more than we need responsible talkers, America and the world demand competent, enlightened, and wholly trustworthy listeners. —*Clients' Service Bulletin*, American Appraisal Co.

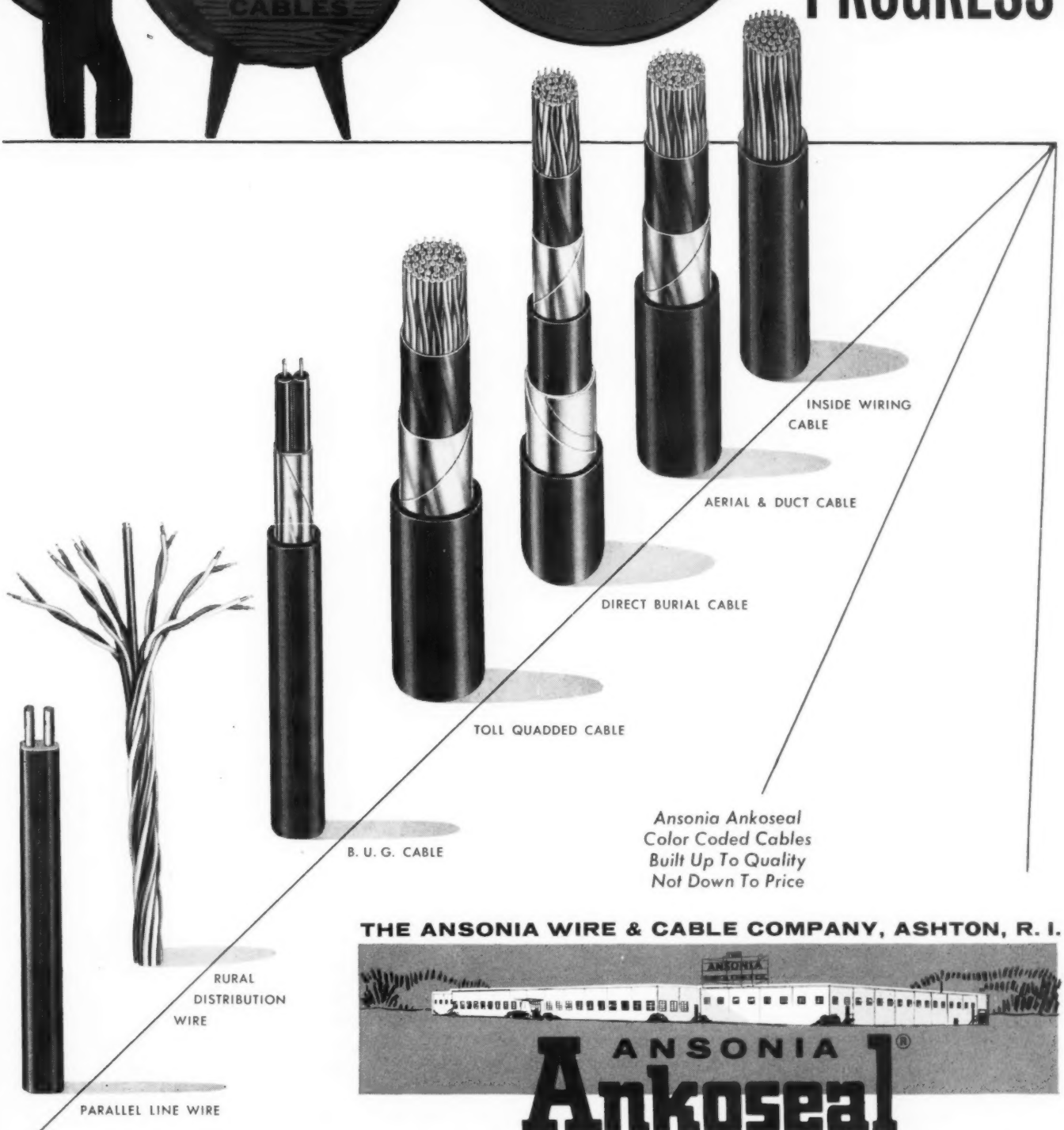
Building Managerial Sense

"I think firms have to give managers and potential managers room to grow in, in much the same way that we give a scientist room to discover whatever

XUM



PARTNERS IN PROGRESS



Ansonia Ankoseal
Color Coded Cables
Built Up To Quality
Not Down To Price

THE ANSONIA WIRE & CABLE COMPANY, ASHTON, R. I.

ANSONIA®
Ankoseal

The Oldest Name In Plastic Telephone Cables In The Most Modern Plant Devoted Entirely To Producing Plastic Cables.

XUM

HERE'S SAFETY—SERVICE

you can always depend on. For Klein tools and equipment are designed better for your jobs—made of the finest materials—individually tested and inspected. Look for the familiar Klein trade-mark—serving the electrical industry "since 1857."

ASK YOUR SUPPLIER

Foreign Distributor:

International Standard Electric Corp., New York

100 years of service to linemen, electricians and industry is back of this new Pocket Tool Guide No. 100. A copy will be sent to you on request, without obligation.

Mathias Klein & Sons
Established 1857 Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

it is possible for him to find. For example, I think we should get young people into the situation of having to make real decisions early in their careers. And I mean hard decisions. After all the necessity to choose between different courses of action is the essence of business discipline. We can expect quite a few mistakes but they have two great advantages. First, the people who make the mistakes will learn more from them than from all their successes. Second, making mistakes early is a good vaccination against making more expensive ones later."—CLEO F. CRAIG, *chairman of the board, American Telephone & Telegraph Co.*

Stromberg Names Executives In Electronics Division

Advancement of several executives in the electronics division of Stromberg-Carlson to new responsibilities has been announced by George A. Peck, vice president and general manager of the division.

These organizational changes are made necessary by the rapidly expanding volume and scope of the electronics division, and will facilitate the efficient operation of the division, Mr. Peck said. Stromberg-Carlson is a division of General Dynamics Corp.

The men involved, and their new positions are:

Douglas W. Anderson, assistant to the vice president.

P. R. Sultzbach, production manager.

William F. Hafstrom, manager of marketing—industrial products.

Warren Names Achenbach Engineering Consultant

Charles H. Achenbach, retired head of the power plant development department of the Bell Telephone Laboratories, has been retained by the Warren Manufacturing Co. of Littleton, Mass.

In a report issued by the company it was stated that Mr. Achenbach will serve as engineering consultant in the design and manufacture of rectifier power supplies for battery charging, battery eliminators, and transistor ringing generators for use with selective ringing operations.

C. H. ACHENBACH

It was further indicated that William R. Meyer will be retained in a sales and service capacity for this equipment. Mr. Meyer is well known in the Independent telephone industry; and is a principal in Commercial Electric Co.

Mr. Achenbach has been associated with the Bell System companies since his graduation from the University of Arkansas in 1913. In 1920 he joined the development division of the Western Electric Co. in New York, predecessor of the Bell Telephone Laboratories. In 1931 he transferred from equipment engineering to the power plant development department assuming the duties of head of the department in 1944 and serving in that capacity until his retirement in 1953.

Mr. Achenbach authored four popular articles on central office power equipment which appeared in TELEPHONY in 1955.

1957 Convention Calendar

Association	*Date*	*City*	*Hotel*
South Carolina	Nov. 4 and 5	Clemson	Clemson House
Alabama-Mississippi*	Nov. 11 and 12	Birmingham	Thomas Jefferson
Georgia	Nov. 13 and 14	Savannah	General Oglethorpe
Oklahoma	Nov. 21 and 22	Oklahoma City	Huckins
South Dakota	Nov. 21 and 22	Sioux Falls	Cataract
Florida	Dec. 2 and 3	Miami Beach	Balmoral

*Joint Conventions

CUSTOM DESIGNED TIES AND JEWELRY

So nice to give . . .

MEN'S TIES in wonder crepe

Tie to a perfect knot! They're the ideal choice for your own use, as an award or for a sales campaign. Each tie is imprinted with 3 phones: one red, one yellow, one green. Background color of charcoal gray, charcoal brown or navy.

PHONE SYMBOL JEWELRY

Distinctive SHADOWCRAFT Jewelry. You will find that it meets the most exacting demands for a dramatic, smartly styled accessory. True dimension design gives depth and richness to every piece. The sculptured effect is heightened by the popular antique silver finish. Use individually or assemble into Mr. and Mrs. sets.

For other exclusive telephone specialty items, send for free catalog.

Visit us at the U.S.I.T.A. CONVENTION

WALT BARBER *Advertising Specialties*

397 Valley Brook Dr., N.E., Atlanta 5, Ga. CEdar 7-6395

NOW YOU CAN *"Buzz Thru"* WET CABLE SECTIONS AND TEST FROM FIELD OR OFFICE ENDS WITH A...

MURPHY BUZZER RELAY SET (BR-1)

To increase the usefulness of the famous Murphy Cable Tester, the new Buzzer Relay Set gives you a dependable, economical way of "buzzing thru" wet cable sections over a greater resistance without having to add too many batteries.

The BR-1 will buzz thru a loop resistance of 0 to 1000 ohms. Only one 4½ volt battery is used in the set and it is enclosed in a cabinet with a special "balanced armature" relay. Dimensions of the Murphy Buzzer Relay Set are 3½x6x3 inches. It is shipped complete with a pair of water proof cords for connecting to the Murphy Cable Tester, and a heavy duty 4½ volt battery.

Write for prices and additional information.

Order your new Model VC Test Cords for use with Murphy Cable Tester. Made of high quality, extremely flexible, test wire, they're insulation tested at 20,000 volts . . . assure no "leakage" readings.

MURPHY ELECTRONIC RESEARCH DEVELOPMENT MANUFACTURE
ENGINEERING LABORATORIES, Inc.

4419 Tulsa • Houston 24, Texas

Now! You can sell a P-A-B-X

XUM

*X*o meet *any* business need... and get stock delivery, too!

At Automatic Electric, P-A-B-X orders come in often...go out quickly. No wonder! *Automatic stocks a P-A-B-X board to meet every need.* That's mighty comforting assurance to keep in mind. It means you can offer businesses, large and small, a ready-made P-A-B-X system. It means you can get shipment, *pronto!* As a result, you'll build P-A-B-X sales, as well as satisfied customers.

Keep this in mind, too. The backbone of Automatic's P-A-B-X equipment is quality. In fact, components are identical with those used in Strowger Automatic central office equipment. This is why telephone companies find Automatic's P-A-B-X boards dependable in performance—and almost a stranger to maintenance.

To supplement the many P-A-B-X boards, Automatic provides a wide range of "Auxiliary Services" to meet special needs:

- Night Answer & Transfer
- Tie Lines
- Toll Restricting
- Group Hunting
- Call Forwarding
- Executive Direct-line
- Executive Right-of-way
- Public Address Cut-in
- Code Call
- Telephone Dictation
- Paging Telephone
- Key-calling
- Conference Services
- Automatic Recorder-Announcers
- Secretary Answering
- Direct Line

MAKE SURE YOU GET THIS BIG P-A-B-X SALES KIT!

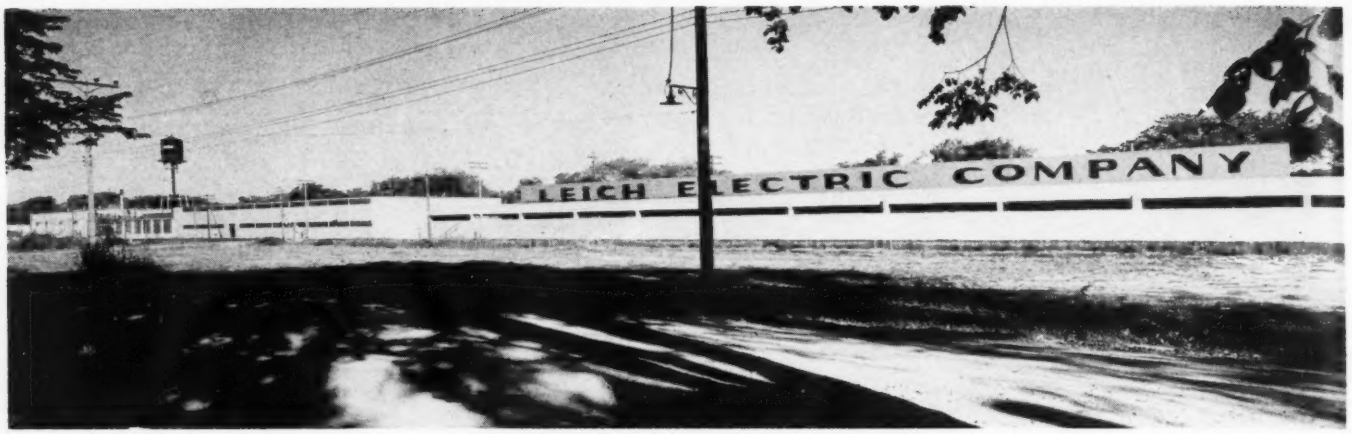
Here's everything you need to promote P-A-B-X. This kit was prepared by P-A-B-X sales experts, and is built around promotions successfully used by many telephone companies. In it, you'll find a step-by-step selling plan, a complete catalog, handy individual equipment and service folders, an 8-page brochure for mailing or personal presentation, suggested sales letters, sample survey form and proposal—even a sample contract. All this material is yours for the asking. Just write: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call Fillmore 5-7111.*

AUTOMATIC ELECTRIC

A member of the General Telephone System—One of America's great communications systems

GENERAL SYSTEM

XUM



Leich Electric factory and general offices at Genoa, Ill. The latest addition at the right gives Leich a total of 160,000 square feet of floor space. The recent 50,000-square-foot addition will be used for material warehousing and by Leich Sales for the supply division's warehouse.

Leich Celebrates Its 50th Anniversary

September 1, 1957, marks the 50th year of the founding of the Leich Electric Co. In 1907, in Genoa, Ill., the Cracraft-Leich Electric Co. was founded.

Cracraft-Leich, now known as the Leich Electric Co., has grown to be one of the major manufacturers of telephone equipment in the United States.

Leich's organizers were J. P. Cracraft, Oscar M. Leich, V. A. Messenger and Sidney Stein Sr. Mr. Cracraft and Mr. Leich came from the Stromberg-Carlson Co., where Mr. Cracraft had been sales manager and Mr. Leich had been chief engineer. Mr. Messenger was formerly secretary-treasurer of the Eureka Electric Co., which company was short-lived and whose plant and equipment Cracraft-Leich took over in Genoa. Mr. Stein was the principal stockholder in the Eureka Electric Co. In charge of the telephone and electrical laboratories in 1907 was A. C. Reid, who had held a similar position with the Stromberg-Carlson Co.

At the time of Leich's founding, hundreds of small companies had started in the manufacture of telephone equipment to serve the rapidly growing Independent telephone industry.

When Mr. Cracraft left the company in 1912, Mr. Leich became general manager and Mr. Reid became chief engineer.

The company's name was changed to Leich Electric Co. on Sept. 1, 1917. Mr. Leich passed away in 1935 and Mr. Reid became general manager.

Leich Electric grew and gained a considerable reputation as a manufacturer of dependable telephone equipment. Its sales, however, were limited by the fact that it did not have a very extensive sales organization.

On June 1, 1937, the Leich Sales Corp. was formed and became the exclusive distributor for the products of Leich Electric Co. Leich Sales also acted as a national distributor for a complete line of telephone supplies.

The principals and founders of the Leich Sales Corp. were W. I. Fisher, president; R. W. Siemund, vice president and general manager; R. G. Faulhaber, vice president and Mr. Reid, vice president. Mr. Fisher came to the new organization from the Joslyn Mfg. & Supply Co. Mr. Siemund had been vice president of the American Automatic Electric Sales Co., now known as the Automatic Electric Sales Corp. Mr. Faulhaber was also from the Automatic Electric organization. Mr. Fisher retired from the Leich organization two years later and Mr. Siemund was made president of Leich Sales.

In 1938, Mr. Reid became president of the Leich Electric Co., with Sidney Stein Jr. becoming chairman of the board. In 1947, Mr. Reid, who had devoted so many years to Leich Electric, retired and became chairman of the board. Mr. Siemund, president of Leich Sales, was also elected president of the Leich Electric Co.

In October, 1947, Leich introduced the Leich dial system. This was a revolutionary development, since it was the first all-relay type switchboard with a built-in multiple. Lines and links could be added by jacking in the additional equipment required.

In November, 1947, a 25,000-square-foot addition was made to the Leich factory at Genoa.

W. J. Caverly was made executive vice president and L. M. Wells was made vice president in charge of manufacturing for the Leich Electric Co. in February, 1948.

Mr. Faulhaber, vice president of Leich Sales, retired in August, 1950.

In November, 1950, Leich Electric Co. and Leich Sales Corp. were purchased by and became subsidiaries of the General Telephone Corp. At this time D. C. Gibson and L. J. Rizzo were made vice presidents of Leich Sales.

In 1953, Leich opened sales branch offices and warehouses in Los Angeles and Dallas. In July, 1953, a 50,000-square-foot, two-story addition was made to the Leich Electric factory in Genoa.

In the same year, Mr. Wells became vice president and general manager of Leich Electric Co., upon the retirement of Mr. Caverly.

On March 31, 1954, Mr. Siemund retired and Leslie H. Warner was made president of Leich Sales Corp. and Leich Electric Co. He came to the Leich organization from the Automatic Electric Sales Corp., of which he was president.

In October, 1956, General Telephone Corp., Leich's parent company, purchased the Automatic Electric manufacturing and sales companies. Mr. Warner was made president of Automatic Electric Co., and D. C. Gibson was made president of Leich Sales Corp. and L. M. Wells became the president of the Leich Electric Co.

Because of increasing business, a new 25,000-square-foot addition is being made to the Leich Electric plant in Genoa and a new separate building is being erected to house the supply division which formerly had been operating in the Leich factory space. A new warehouse building and sales office was recently opened in Tampa, Fla.

The Leich organization has grown from a total of 50 employes in 1907 to 667 persons today, with 552 being employed by Leich Electric Co. and 115 working at Leich Sales.

SEVEN LEAGUE BOOTS

are needed to reach the places
where we are serving
with an International reputation
for
excellent telephone work
on time.

◆

We have left the imprint of our boots in:

Alaska	Iceland
Antigua	North Africa
Azores	Panama
Bahama Islands	Philippine Islands
Brazil	Puerto Rico
British Guiana	St. Lucia, B.W.I.
Dominican Republic	Spain
Dutch Guiana	Trinidad, B.W.I.
Germany	United States
Greenland	Virgin Islands

◆

GUSTAV HIRSCH ORGANIZATION, INC.

Consulting Engineers and Contractors to the telephone industry all over the World

1347 West Fifth Avenue, Columbus 12, Ohio

RESISTS OLD AGE

THANKS TO "YOUNG PROCESS"!

Kennecott's exclusive "Young Process" lead sheath does much to lengthen the life of Kennecott Telephone Cable. This sheath production method virtually eliminates oxides and impurities! Sheath is far more uniform in strength and burst resistance, with greatly reduced weld area. It provides increased protection against damage and aging. Cable retains full electrical properties over its long life! Contact the Chase sales office near you for full information.

IT'S KENNECOTT TELEPHONE CABLE

CHASE BRASS & COPPER CO., WATERBURY 20, CONN.
DISTRIBUTOR FOR

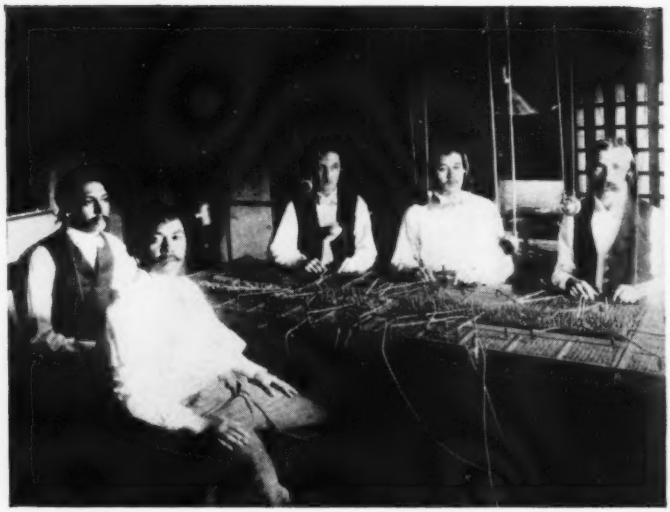
KENNECOTT WIRE & CABLE CO.

SUBSIDIARIES OF KENNECOTT COPPER CORPORATION

CHASE WAREHOUSES and OFFICES:

Atlanta	Cincinnati	Grand Rapids	Milwaukee	New Orleans	St. Louis
Baltimore	Cleveland	Houston	Minneapolis	Philadelphia	San Francisco
Boston	Dallas	Indianapolis	Newark	Pittsburgh	Seattle
Charlotte	Denver	Kansas City, Mo.	New York (Maspeth, L. I.)	Providence	Waterbury
Chicago	Detroit	Los Angeles		Rochester	

XUM



LEFT PHOTO: Today the Hawaiian Telephone Co. has been completely converted to dial. Pleasant transpacific operators handle calls to cities throughout the world. RIGHT PHOTO: Male operators worked at flat-type switchboards in Hawaii until the late 1890's. The Hawaiian Telephone Co. was chartered in 1883 by King Kalakaua.

Hawaiian Company Completes Conversion to Dial

The Hawaiian Telephone Co., operating more than 160,000 telephones, has completed its full conversion to automatic operation. The company, which serves the entire territory, pioneered in the adoption of Strowger automatic equipment as long ago as 1910.

The last magneto telephone in the islands has been replaced by Strowger equipment at Kamuela, on the "Big Island" of Hawaii. The community, located in the rich range country of the Waimea Plateau, is the site of the second largest cattle ranch in the world.

Hawaii has long played an historic role in the pioneering of telephone service. The Islands' first telephones were installed on the island of Maui in 1878 . . . only three years after Bell first managed to transmit speech sounds over a wire. In 1883, King Kalakaua, then monarch of the islands, chartered the firm now known as Hawaiian Telephone Co.

In 1898 Hawaii was annexed as a Territory by the United States and 12 years later installed one of the early Strowger automatic exchanges. The

LOOK TO THE LEADER...
LOOK TO LINDSAY

FOR RELIABILITY • SERVICE
• NATIONALLY KNOWN TELEPHONE SUPPLIES

Lindsay knows from years of experience that telephone companies cannot compromise on supplier's quality. Reliability, service, and lines—all must be outstanding. This knowledge has played an important part in the Lindsay tradition of leadership.

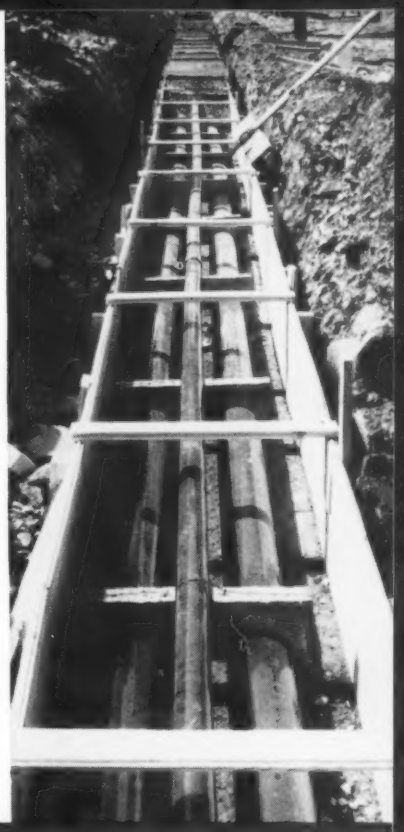
THE LINDSAY TELEPHONE SUPPLY CO.
10409 Meech Ave., Cleveland 5, Ohio • Tel. Diamond 1-9212

Butyrate conduit means direction changes without fittings

The semi-rigid nature of Tenite Butyrate allows the engineer maximum flexibility in planning and revising—since many direction changes can be made without costly and job-prolonging fittings.

Butyrate conduit means resistance to corrosion

Conduit of Tenite Butyrate is unaffected by corrosive and electrolytic action of soil. This is your assurance of many years of trouble-free service.



What can conduit of Tenite Butyrate plastic mean to you?

Conduit made of Tenite Butyrate plastic means many things to many utilities—for use in carrying both electric power and telephone cables.

To Long Island Lighting Company, Hicksville, N.Y., for example, Butyrate conduit meant resilience—which enabled it to meet conditions encountered in filled-in marsh areas. Conduit of Tenite Butyrate "gives" with ground movement instead of parting or fracturing.

To other companies it may mean: freedom from corrosion, high impact strength, non-inductance, ease in cutting and joining, extra-smooth walls, or semi-rigidity.

All of these benefits of Tenite Butyrate plastic are available to you—plus the economies in installation and maintenance which accompany them.

Discover how you can share in these benefits. For complete information and a list of suppliers in your area, mail the coupon below.

1932—EASTMAN'S 25TH YEAR IN PLASTICS—1957

Butyrate conduit means lightness in weight

Conduit of Tenite Butyrate is extremely easy to handle, thanks to its light weight. A 20' length of 4" conduit can literally be carried "with one hand behind your back."

TENITE BUTYRATE

an Eastman plastic

EASTMAN CHEMICAL PRODUCTS, INC.
subsidiary of Eastman Kodak Company, Kingsport, Tennessee

Please send me information on cable conduit made of Tenite Butyrate and a list of companies manufacturing Butyrate conduit and fittings.

NAME_____

POSITION_____

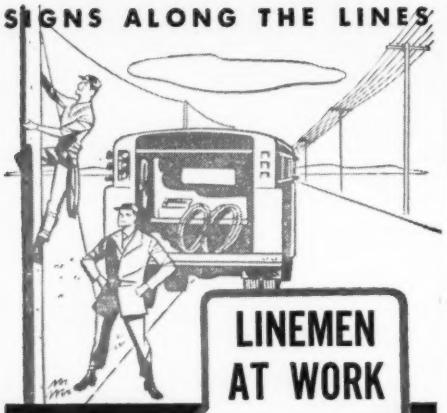
COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

SIGNS ALONG THE LINES



LINEMEN AT WORK

USING
Crapo GALVANIZED
GUY & MESSENGER STRAND

Positive strength and durability economies, combined with the superior qualities of steel, make Crapo Galvanized Steel Strand a rugged performer. The heavy, ductile, tightly-adherent galvanized coating — applied by the famous Crapo Process — provides dependable protection for the steel, prolongs the expectant life of the strand. There is a size and grade of Crapo Galvanized Strand for every practical need.

INDIANA
STEEL & WIRE COMPANY, INC.
Muncie, Indiana

TELE-MUFF Jr.

The Head Set Ear Cushion
Designed Especially for
Switchboard Operators

Made of Soft Pliable
Vinyl Foam

- Easy on Ear
- Inexpensive
- Attractive

Write for Details

Thanks for your splendid response. All orders being shipped promptly.

TELE-MUFF CO.
Box 832
San Fernando, Calif.

Hawaiian Telephone Co., known as Mutual Telephone prior to 1954, has kept pace with the swift economic growth of the Territory and, at the same time, has consistently worked toward complete modernization of its far-flung facilities.

Since World War II it has more than trebled its number of telephones in service. In addition to the company's heavy volume of inter-island and local traffic, its operators last year handled more than 205,000 trans-Pacific calls.

Last year Hawaiian Telephone Co. spent $6,550,000 for new plant construction. The point of modernization attained by the company is pointed up by the fact that 63 per cent of the value of its total plant in service is represented by dollars expended for construction in the past six years.

In 1956 the total value of Hawaiian Telephone's plant was estimated at nearly 60 million dollars.

FOR ALL OF YOUR CENTRAL OFFICE AND PBX INSTALLATIONS, MODIFICATIONS, AND ENLARGEMENTS, IT'S THE

T. E. I.
TELEPHONE ELECTRONICS INSTALLATION CORP.
Hayes Bldg., 12 E. Tenth St., Erie, Pa.
CAN WE BE OF SERVICE TO YOU?

Construction Crews — Station Installers
Central Office Installations
Cable Splicers — Complete Engineering

HENKELS & McCOY
6100 North 20th Street — Philadelphia, Pa.
Now Operating in 30 States
OFFICES LOCATED AT

Elkhart, Indiana ..... Tel. 2-5650
Ashland, Ohio ..... Tel. 3-7543
Lansing, Michigan ..... Tel. IV-5-7642
Springfield, Illinois ..... Tel. 4-7360
Erie, Pennsylvania ..... Tel. 2-4300
Sumter, South Carolina ..... Tel. HO-9-3332
Ocala, Florida ..... Tel. MA-9-1284

PERFORMANCE Has Built Our Business

NOW! A HEAVY-DUTY
INDUSTRIAL DIGGER
that is TRACTOR MOUNTED

Designed for RUGGED DIGGING
- Telephone Poles
- Footings
- Heavy Posts

• Digs Faster . . . Deeper. (Up to 6 Ft. Through Any Kind of Soil)
• Fits Most Large Farm and Industrial Tractors
• One Man Operated
• Amazing Low Cost

Prewitt's NEW INDUSTRIAL DIGGER allows one man to do the job it would ordinarily take a crew of men to do. P.T.O. driven, it utilizes full weight of rear of tractor to force auger into ground. Saves time and money!

See Your Dealer or
WRITE FOR FREE LITERATURE
Dept. 304

J.R. PREWITT AND SONS
SINCE 1929
Pleasant Hill, Missouri
Phone 40

NATCO
CLAY CONDUIT

The proved and standard protection for Underground Telephone Cables. Highest quality and full line of shapes.

NATCO CORPORATION
327 Fifth Avenue, Pittsburgh 22, Pa.

CABANISS-POGUE COMPANY
Consulting Engineers
Appraisals—Cost and Rate Studies
Financial Assistance
GRANT BLDG., ATLANTA, GEORGIA

CARL C. CRANE, INC.
Consulting Engineers
2702 Monroe Street, Madison 5, Wis.
Telephone CEdar 3-4210

ENGINEERING ASSOCIATES, INC.
Consulting Engineers
79 W. PEACHTREE PLACE, N. W.
ATLANTA, GEORGIA
TELEPHONE: JAckson 3-5925

McGRATH ENGINEERING, INC.
Consulting Engineers
209 West 6th Street
TOPEKA, KANSAS
Telephone CE 2-2358

SLOAN, COOK & LOWE
CONSULTING ENGINEERS
Appraisals—Original Cost Studies
Plant, Traffic and Commercial Engineering
120 S. La Salle St.
Chicago 3, Ill. Tel: FRanklin 2-5924

ROBERT E. FOLEY CONSTRUCTION CORP.
DESIGN—SURVEYS—APPRAISALS—Construction and Maintenance of Overhead and Underground Telephone Plant. Complete supply of poles available for emergency requirements.
48 GRISWOLD STREET
BINGHAMTON, N. Y. TEL. 2-7215

YATES CONSTRUCTION CO.
"Specializing in Telephone Construction"
Cable Splicers, Telephone Installers, Equipment Installers, Construction crews.
1507 SOUTH SIXTH ST. PADUCAH, KY.
TELEPHONE 2-4623

HARRIS-McBURNEY CO.
PUBLIC UTILITY CONSTRUCTION
A complete construction service for the telephone industry
Construction Crews Engineering
Station Installers Appraisals & Reports
Cable Splicers C. O. Installation
Underground Duct Systems
Telephone ST 4-6126
P. O. Box 267 Jackson, Michigan

INSPECTION SERVICE AT TIMBER TREATING PLANTS
Of poles, crossarms, and preservative treatments. Analyses of wood preservatives. Consulting and specification writing.
Inspectors stationed throughout U.S.A.
A.W.WILLIAMS INSPECTION CO., INC.
MOBILE, ALABAMA

ATLANTIC
Creosoting Co., Inc., 17 Battery Pl., N. Y. C.
Creosoted Pine Poles • Crossarms
PLANTS AND OFFICES
Boston, Mass. Portsmouth, Va.
New York, N. Y. Philadelphia, Pa.
Savannah, Ga.

CONROE CREOSOTING COMPANY
P. O. BOX 109
CONROE, TEXAS
Pressure Treated Southern Yellow Pine Crossarms and Poles
Prompt Service Given Small Orders As Well As Large Ones

L. D. McFARLAND COMPANY
Box 390 • Sandpoint, Idaho
WESTERN RED CEDAR, DOUGLAS FIR, WESTERN LARCH AND LODGEPOLE PINE. CREOSOTE AND PENTA BUTT OR FULL-LENGTH TREATED POLES.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Cascade Pole Co., P.O. Box 743, Tacoma, Wash. — Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co.—Northern White Cedar Poles, Pentachlorophenol treated. Plant and Yards, Phelps, Wis.

Dierks Forests, Inc. (formerly Dierks Lumber & Coal Co.) Wood Preserving Division, 810 Whittington Ave., Hot Springs, Arkansas. Southern Pine select poles, all sizes and lengths, creosote and penta-pressure treated. Prompt shipment.

Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

International Paper Co., Long Bell Division, 926 Grand Ave., Kansas City, Mo. —Pressure-treated Southern Pine and Douglas Fir Poles. Creosote and Penta preservatives.

Montana Pole & Treating Plant—Box 2004, Butte, Montana. Penta-Pressure treated Lodgepole Pine and Western Larch Poles. Inquiries invited.

Texas Creosoting Company—512 Main Street, Orange, Texas—Creosoted Southern Yellow Pine and Douglas Fir Poles. Can also treat with "Penta."

WANTED
MAGNETO TELEPHONES OF ALL TYPES
CONTACT MR. ANTHONY SALLEY
AT THE CONVENTION
OR AT CONGRESS HOTEL
TELEPHONE ENGINEERING CO.
SIMPSON PENNSYLVANIA

ORDER FROM L. E. S. AND PAY LESS
CABLE SPLICING TOOLS & SUPPLIES
PROMPT DELIVERY FROM STOCK
Send for Bargain Stock List No. CS.
LINE EQUIPMENT SALES
529 So. Dearborn St., Chicago 5, Ill.

What You Want When You Want It
Immediate Shipment from Nearest Warehouse Points
TELEPHONE & POWER SUPPLY, INC.
TOPEKA, KANSAS PHONE 4-8788

TELEPHONE PRINTING
By People Who Know the Telephone Business
SEE THE SUTTLE CATALOG
SUTTLE EQUIPMENT CO.
LAWRENCEVILLE ILLINOIS

KILLOREN COMPANY
Construction crews—Installers
Cable Splicers
30 years experience
136 N. State St. Appleton, Wisconsin
REgent 3-5549

TUDOR AND YAGER, INC.
Telephone Construction
TIPTON, INDIANA
PHONE 125

CABLE SPLICERS • LINEMEN
STATION INSTALLERS
STEADY WORK, GOOD PAY
MIDWEST LOCATION.
The Weikel Line Company, Inc.
FORT WAYNE, IND.

Complete outside telephone plant builders. From frame to the phone
MULLEN CONSTRUCTION COMPANY
2002 E. Wisconsin Ave. REgent 4-9881
Appleton, Wisconsin

CLASSIFIED SECTION

Rates 15 cents per word payable in advance. Minimum charge $3.00 for 20 words or less. Classified advertisements must reach us 8 days before publication date.

POSITION WANTED

MANAGER OR SUPERINTENDENT for small or medium size system, commercial or industrial. Experienced in REA, Bell and Independent operations. Married, age 38 with 16 years telephony experience. Can take full charge. Detailed résumé upon request. Please describe system. Western states preferred. Write Box No. 4027 c/o TELEPHONY.

MANAGER OR MAINTENANCE for 350 stations and up. 29 years' experience inside and outside plant. 54 years old. Prefer Iowa. Write Harry Antwine, Wyoming, Ia.

HELP WANTED

EXPERIENCED CABLE SPLICER for 16 exchanges in Southern Indiana. Write Box No. 4021, c/o TELEPHONY.

WANTED: Telephone Installers, Cable Splicers, Linemen, Central Office Installers. Yates Construction Company, 1507 South 6th St., Paducah, Kentucky. Telephone 2-4623.

SALESMEN WANTED — engineering products selling to Utilities, Telephone Companies, Railroads—with minimum two years experience and now employed. Wish to relocate? Write in confidence. Not an employment agency. We locate men with know-how and know-who for industry. WILLIAM J. McILVANE, 725 15th St., N.W., Washington 5, D. C.

HELP WANTED

CABLE SPLICERS, Station Installers, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1211 Kenmore Avenue, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

ENGINEERS WANTED—every category. Wish to relocate? Write in confidence. Not an employment agency. We locate men with know-how for industry. WILLIAM J. McILVANE, 725 15th St., N.W., Washington 5, D. C.

PLANT ENGINEERS for large Independent Telephone Company. Some experience necessary. In reply state age, educational and employment history. Address reply to Personnel Supervisor, Rochester Telephone Corporation, 10 Franklin Street, Rochester 4, N. Y.

COMMERCIAL ENGINEER for a West Coast telephone company. Prefer college background in Business Administration or Journalism. Must have recent telephone commercial experience and be qualified to formulate and maintain commercial instructions, practices, work performance, correspondence and allied routines. Familiarity with telephone accounting essential as duties include monthly reconciliation of budget with actual and preparation of annual commercial budget. Send recent photograph, résumé and salary requirements to Box No. 4020, c/o TELEPHONY.

HELP WANTED

SALESMAN, telephone supplies and equipment in midwest. National organization, chance for rapid advancement. Give full particulars. Write Box #4025, c/o TELEPHONY.

MANAGER to direct personnel in all phases of telephone operations for a four exchange dial system. Dial C. O. maintenance experience necessary. Inquiries should include experience, salary expected and date of availability. Write Camden Rural Telephone Co., Camden, Mich.

TELETYPE REPAIRMAN—excellent opportunity for advancement with a fast-growing southern California Independent telephone company. Submit complete résumé of experience, training and education, including references and recent photograph to Box No. 4022, c/o TELEPHONY.

JOURNEYMAN EQUIPMENT INSTALLER—REPAIRMAN. Qualified in Strowger step, North CX and all types of CXR equipment. Reply attention Equipment Superintendent, Inter-County Telephone & Telegraph Co., Box 390, Fort Myers, Fla.

KELLOGG SWITCHBOARD EQUIPMENT
(RECONDITIONED)

JACK and LAMP STRIPS

#274 Spring Jacks
#269 Spring Jacks
#267 Spring Jacks
#239 Spring Jacks
#34 Lamp Jacks

RELAYS

#2029-SAH and #2048-SFG Line & Cut-off
#2029-SAH and #2048-SR Line & Cut-off
#2093-CEA and #2059-CDG Univ. Line & Cut-off
#26-D Line Relay

REPEATING COILS
#21-A #19-A

PROTECTION
Many types central office protection, reconditioned and in excellent condition.

Whatever Your Needs . . . It Pays to Call BUTELCO

BUCKEYE TELEPHONE & SUPPLY CO.
Dept. T, 1250 Kinnear Rd. HU 8-0655 Columbus 21, Ohio

RETIRED PRESIDENT
Or
VICE-PRESIDENT
To Coordinate
Overseas Project!

A team of management level and installation telephone personnel are presently planning, engineering, and constructing a telephone communications system over-seas. The PHILCO CORPORATION is in need of a top level retired telephone president or vice-president to coordinate the operational mission using established Bell System Practices. This man must be thoroughly qualified from a general telephone management point of view in all phases of civil-tel communications. He will coordinate, direct, and be responsibile for the activities of all the personnel on this program. This is an exceptional opportunity which will offer tremendous personal satisfaction and achievement plus excellent financial remuneration.

Direct detailed resume to

PHILCO
TECHREP DIVISION
Personnel Department
22nd & Lehigh Avenue
Philadelphia 32, Pa.
All replies confidential.

HELP WANTED

SWITCHBOARD MAINTENANCE MAN familiar with Kellogg 7-3 crossbar to take over full responsibility of 850-line terminal per station switchboard in central Illinois. Permanent position. Inquiry should include experience and date of availability. Write Staunton Telephone Co., Staunton, Ill.

FOR SALE

NORTH PX-30 DIAL PAX. Needs only battery eliminator and cleaning. $500.00 FOB, Mobile, Alabama. D. L. Hogan, 1412 Polaris Drive.

1—KELLOGG RELAYMATIC AUTOMATIC DIAL SWITCHBOARD. Of 100 line capacity; equipped for 80 lines with 8 conversational links. Phones and lines not included. Used 1 year—A-1 condition. P. H. Glatfelter Co., Spring Grove, Pa.

NORTH ELECTRIC CX-100 SWITCHBOARD available immediately. Fully equipped 100 lines, 13 links, excellent condition, 12 local 3 toll trunks, batteries, charger, main frame complete. Purchased new 1950. Will sacrifice. For further particulars write Fredericksburg & Wilderness Telephone Co., Chancellor, Va., or call A. R. Pemberton, Jr., Chancellor, Va., HU 9-2400 or ST 6-2681.

FOR LEASE: Small Southwest telephone company, dial; consider only man and wife experienced in small exchange maintenance and switchboard operation. On percentage you should earn $750 or better monthly average, work toward increase in business. Give references, experience, education. Write Box #4026, c/o TELEPHONY.

FOR YOUR DESK AT WORK OR HOME

Ideal for gifts, prizes

Bantam colored telephone, weighted, with top quality ball point pen trimmed in gold. Telephones in ivory, beige, yellow, red, green, blue, brown, gray. Pens in ivory, black, red, pink. Only $3.25 ea. postpaid. Send check or money order to W. H. Parker, 2741 Ridgeview Dr., San Diego 5, Calif.

This product is locally available in many cities from Junior Achievement Companies. Consult your directory. "Building through Business for a Better America. Support Junior Achievement."

BETTER TRANSMISSION VF OR CARRIER

COPPERWELD LINE WIRE

Save 20% & up

#12 AWG (.080) 40% conductivity—high strength

Unused—Original factory coils (average 100 lbs.)

export wrapped—bright (100% perfect)..37¢ lb.

single—wrapped—some tarnish—good...32¢ lb.

—guaranteed all usable—shipped on approval—

freight allowed on carloads

Telectric Co.

1218 VENICE BOULEVARD **Richmond 8-2249**

Los Angeles 6, Calif.

FOR SALE

KELLOGG SWITCHBOARD AVAILABLE NOV. 3, 1957. See this one first. In service now at Jefferson, Iowa. Excellent condition.

COMPLETE:

- Decimonic-Automatic Ringing — 3 Appearances
- 4 Universal Positions 17 Cord ckts each
- 2 Secret Service Positions 19 Cord ckts each
- 1200 C.B. Local Lines (Capacity 1600)
- 40 Pay Station Lines
- 40 C.B. Rural 24 Volt (Reversing Jacks) Lines
- 20 C.B. Rural 48 Volt (Reversing Jacks) Lines
- 30 R.D. Toll Lamp ended.
- 12 ckts Transfer Service
- 3 Loop Dial Trks
- 3 Position Dials & Cords
- 10 Inter Position Trunks
- 1 32 Line Fire Grouping ckt
- Msc. Equipment
- 24 Cells #24DF 7 Batteries (good as new)
- 2 Lorain #V300 D Chargers
- 1 North #1104 Chargers
- 2400 C. Pr. MDF
- 1300 Pr. Protection (500 Cook #100)
- 1 Standby Pole Changer (Decimonic)
- 1 Test Desk
- 1 Power Bd.

Also available now 1000 Decimonic, handset, Kollcord phones. All good as new, blank for dial. 900, 925, 9817, 648, etc. All individually boxed.

For information, contact
C. H. DAUBENDIEK, Tel. #662
Box #267, Jefferson, Iowa

WANTED TO BUY

LEICH MAGNETO TELEPHONES or parts (901 set). Telephone Engineering Co., Simpson, Pa.

MAGNETO TELEPHONES AND PARTS. Highest market prices. Write Telephone Company, Turtle Lake, Wisconsin.

TELEPHONES—all types—any condition; candlesticks, wall sets, etc. Write advising quantities available. Our truck will pick up. Reply to Box No. 3952, c/o TELEPHONY.

TELEPHONE COMPANY, two or three hundred stations, will convert to automatic. Kentucky, Virginia, or surrounding territory. Write Box No. 4019, c/o TELEPHONY.

ONE POSITION 165 Line magneto switchboard, 15 cord circuits. Must be good. Send details, price to Nash Rural Telephone Co., Nash, Okla.

. . . A NEW TAPE FOR THE NEW SPLICES . . .
ALUMINUM TAPE FOR THOSE ALUMINUM COVERED CABLES
Continue the electrical value at the splice with aluminum to aluminum, with metal tape wrap.
Prevents galvanic action too.
Handy also for pressure forming into straps and ties.
¾"x25 ft rolls $1.00 each. (Patents Pending)
Distributors invited.
AMERICAN METALS TAPE CO., 598 THIRD AVENUE, TROY, N. Y.

Am interested in buying operating company with more than 1000 telephones and good growth possibilities. Write Box No. 4014, c/o TELEPHONY.

Index to ADVERTISERS

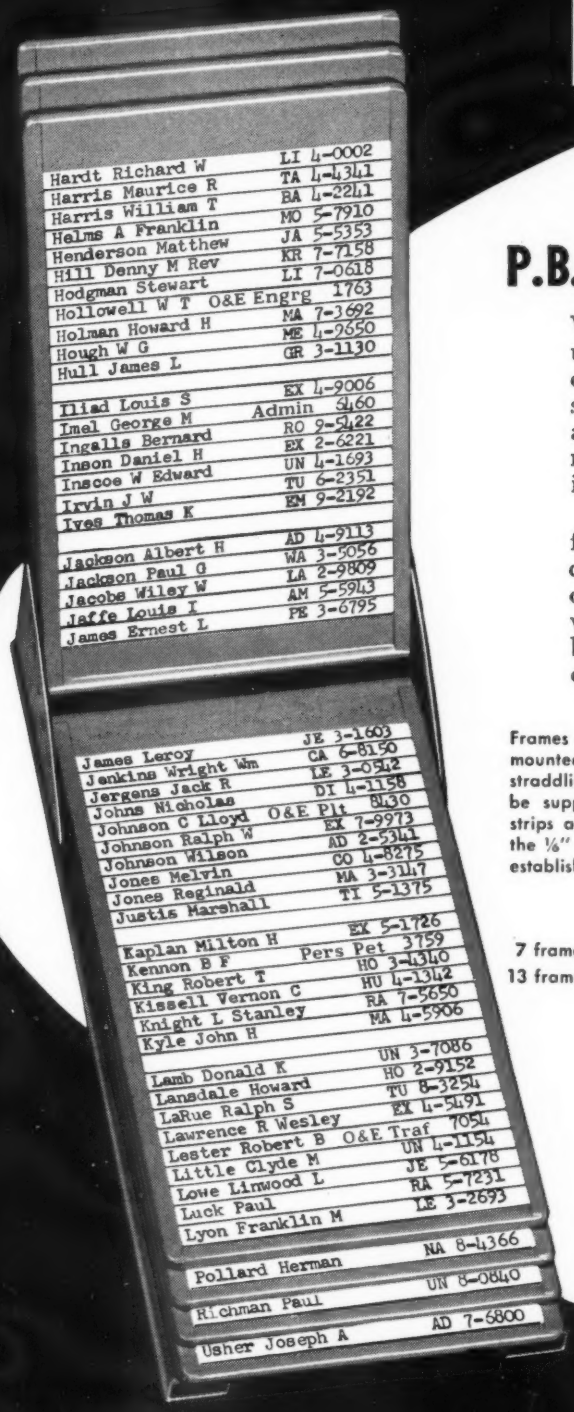
	Page
Acme Visible Records, Inc.	75
Alphaduct Wire & Cable Co., The	—
Aluminum Company of America	—
American Chain & Cable Co., Inc. Page Steel & Wire Div.	—
Wright Hoist Div.	—
American Creosoting Corporation	—
American Electrical Heater Co.	—
American Steel & Wire Co.	—
American Telephone & Telegraph Co.	—
Anaconda Wire & Cable Co.	12-13
Ansonia Wire & Cable Co., The	61
Armstrong Cork Co., Glass Insulators	54
Arrow Fastener Co. Inc.	—
Atlantic Creosoting Co., The	71
Automatic Electric Sales Co.	40-41, 64-65
Bakelite Company	—
Baker Wood Preserving Co.	—
Bartlett Tree Experts	—
Barber Advertising Specialties	63
Bashlin Company, W. M.	60
Bell Telephone Laboratories, Inc.	17
Benner-Nawman, Inc.	—
Berry & Co., L. M.	—
Bethlehem Steel Co.	—
Biddle Co., James G.	—
Bishop Manufacturing Corp.	—
Blaw-Knox Company	—
British Insulated Callenders' Cables, Ltd.	—
Buckeye Telephone & Supply Co.	72
Budelman Radio Corp.	—
Burgess Manning Company	—
Burroughs Corp.	—
C&D Batteries, Inc.	57
Cabaniss-Pogue Co.	71
Cable Breather Corp.	—
Cable Spinning Equipment Co.	—
Calculagraph Company	53
Chance Co., A. B.	51
Chase Brass & Copper Co.	67
Cleveland Inst. of Radio Electronics	—
Coffing Hoist Div.	56
Colorado Fuel & Iron Co., The	—
Commercial Cord and Supply Co.	—
Communication Equipment & Engineering Co.	—
Comptometer Corporation	—
Conroe Creosoting Company	71
Cook Electric Company	—
Copperweld Steel Co.	—
Crane, Inc., Carl C.	71
Cullom & Ghertner	—
Davis Construction Co.	—
Donnelley & Sons, R. R.	—
Dow Chemical Co., The	31
Du Pont de Nemours & Co., E. I.	—
Duo-Safety Ladder Corp.	56
Eastman Chemical Products, Inc.	69
Edmund Scientific Company	—
Electric Specialty Co.	—
Electronic Secretary Industries, Inc.	—
Engineering Associates, Inc.	71
Everstick Anchor Co.	—
Executone Inc.	—
Exide Industrial Division— The Electric Storage Battery Co.	—
Fisher Research Laboratories, Inc.	—
Fitchburg Engineering Corporation	—
Foley Constr. Co., Robert E.	71
Free-Lock Corporation	—
General Cable Corporation	—
General Insulated Wire Works, Inc.	—
General Machine Products Co., Inc.	—
General Telephone Directory Co.	Back Cover
Gorman Rupp Company	—
Gould-National Batteries, Inc.	18
Graybar Electric Co.	39
Greenlee Tool Co.	—
Haley & Co., R. G.	—
Harris-McBurney Company	71
Henkels & McCoy	70
Highway Trailer Company	—
Hirsch Organization, Inc., Gustav.	67
Holan Corp., J. H.	—
Homelite Corp.	—
Hubbard & Company	—
Indiana Steel & Wire Co.	70
Industrol Corporation	—
Ingram-Richardson Mfg. Co.	—
International Business Machines Corp.	—
International Harvester Co.	—
Irwin Auger Bit Co.	—
Johns-Manville	—
Katolight Corp.	—
Kearney Co., Jas. P.	—
Kellogg Switchboard & Supply Co.	6-7, 44-45, 59
Kennecott Wire & Cable Co.	67
Killoren Company	71
Klein & Sons, Mathias	62
Koiled Kords, Inc.	—
Koppers Co., Inc.	—
Leich Sales Corporation	10-11
Lindsay Telephone Supply Co.	68
Line Equipment Sales	71
Lorain Products Corp., The	9
Magnolia Chemical Company, Inc.	—
McFarland Company, L. D.	71
McGrath Engineering, Inc.	71
Morrison-Pelsue Co.	—
Mullen Construction Co.	71
Murphy Engineering Laboratories	63
Natco Corporation	70
National Pole & Treating Div.	—
National Standard Company	—
National Telephone Supply Co.	—
Neubauer Manufacturing Co.	—
Neuses, Inc., P. K.	—
North Electric Company	14-15
Onan & Sons, D. W.	—
Orangeburg Manufacturing Co., Inc.	—
Osmose Wood Preserving Co.	—
Ostlund, Evert M.	—
Owens-Illinois	—
Page & Hill, Inc.	—
Parker, W. H.	73
Phelps Dodge Copper Products Corp.	—
Philco Corp. Gov't. & Industrial Div.	2-3
Philco-Tech Rep. Div.	72
Piedmont Wood Preserving Co.	—
Plastic Wire & Cable Co.	—
Porcelain Products, Inc.	—
Porter, Inc., H. K.	58
Prairie Implement Co.	—
Preformed Line Products Co.	16
Prewitt & Sons, Inc., J. R.	70
Prodelin, Inc.	—
Radio Engineering Products Ltd.	—
Raytheon Mfg. Co.	47
Recordak Corp.	—
Reliable Electric Company	33-36, 43
Remington Rand Div.	—
Rex Corporation, The	—
Reynolds Metals Company	—
Roebling's Sons Corp., John A.	—
Rolatape, Inc.	—
Runzel Cord & Wire Co.	—
S&G Manufacturing Corp.	55
Schauer Mfg. Co.	—
Sequoia Process Corp.	—
Seymour Smith & Son, Inc.	—
Sierra Electronic Corp.	—
Sloan, Cook & Lowe Co.	71
Soapstone Duct Co.	52
Stainless, Inc.	—
Stanley-Yankee Tools, Inc., a subsidiary of The Stanley Works	—
Stewart Bros.	—
Stewart-Warner Corp., Electronics Div.	—
Stromberg-Carlson Co.	4-5, 28, 48-49, 70
Superior Cable Corporation	46
Suttle Equipment Co.	71
Taylor-Colquitt Co., The	—
Telectric Co., The	73
T.E.I. Corp.	70
Tele-Muff Co.	70
Telephone & Power Supply Co.	71
Teletype Corp.	—
Tele-Wire Supply Co., Inc.	—
Telkor, Inc.	—
Templeton Kenly & Co.	—
Thornhill Publishing Co.	—
Transandean Associates, Inc.	—
Truck Equipment Company	—
Tudor & Yager, Inc.	71
U. S. Cable Constructors, Inc.	—
United States Independent Telephone Association	—
United States Instrument Corp.	—
United States Steel Corp. American Steel & Wire Co.	—
Universal Controls Corp.	44-45
Utica Drop Forge & Tool Div.	—
Utility Body Co.	—
Utility Tool & Body Co.	—
Weikel Line Company	71
Western Electric Co.	—
Wheelock Signals, Inc.	—
White Motor Company, The	—
Whitney-Blake Co.	—
Williams Inspection Co., Inc., A. W.	71
Wiremold Co., The	58
Wyoming Valley Equipment Div.	—
Yates Construction Co.	71
York-Hoover Corporation	—

WESTERN REPRESENTATIVE:
McDonlad-Thompson, 625 Market St., San Francisco, Cal.; 3727 W. Sixth St., Los Angeles; Colorado National Bank Bldg., Denver, Colo.; National Bldg., Seattle, Wash.; 3217 Montrose Blvd., Houston, Tex.; 2010 S. Utica, Tulsa, Okla.

ACME VISIBLE

FLEXOLINE

P.B.X. KEYSHELF DIRECTORY UNITS


Hardt Richard W LI 4-0002
Harris Maurice R TA 4-4341
Harris William T BA 4-2241
Helms A Franklin MO 5-7910
Henderson Matthew JA 5-5353
Hill Denny M Rev KR 7-7158
Hodgman Stewart LI 7-0618
Hollowell W T O&E Engrg 1763
Holman Howard H MA 7-3692
Hough W G ME 4-2650
Hull James L GR 3-1130
Iliad Louis S EX 4-9006
Imel George M Admin 5460
Ingalls Bernard RO 9-5422
Inson Daniel H EX 2-6221
Inscoe W Edward UN 4-1693
Irvin J W TU 6-2351
Ives Thomas K EM 9-2192
Jackson Albert H AD 4-9113
Jackson Paul G WA 3-5056
Jacobs Wiley W LA 2-9809
Jaffe Louis I AM 5-5943
James Ernest L PE 3-6795
James Leroy JE 3-1603
Jenkins Wright Wm CA 6-8150
Jergens Jack R LE 3-0542
Johns Nicholas DI 4-1158
Johnson C Lloyd O&E Plt 8430
Johnson Ralph W EX 7-9973
Johnson Wilson AD 2-5341
Jones Melvin CO 4-8275
Jones Reginald MA 3-3117
Justis Marshall TI 5-1375
Kaplan Milton H EX 5-1726
Kennon B F Pers Pet 3759
King Robert T HO 3-4340
Kissell Vernon C HU 4-1342
Knight L Stanley RA 7-5650
Kyle John H MA 4-5906
Lamb Donald K UN 3-7086
Lansdale Howard HO 2-9152
LaRue Ralph S TU 8-3254
Lawrence R Wesley EX 4-5491
Lester Robert B O&E Traf 7054
Little Clyde M UN 4-1154
Lowe Linwood L JE 5-6178
Luck Paul RA 5-7231
Lyon Franklin M LE 3-2693
Pollard Herman NA 8-4366
Richman Paul UN 8-0840
Usher Joseph A AD 7-5800

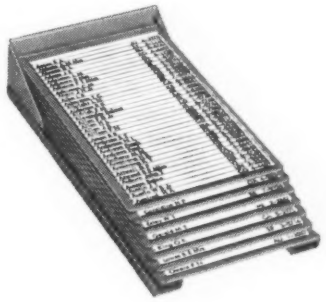
With direct distance dialing, it is essential for users of P.B.X. Boards to have a visible record of all frequently called numbers. Flexoline Keyshelf Directory units are specifically engineered and designed for use on P.B.X. boards and furnish the flexibility of individual Flexoline listings on the keyshelf.

The last Flexoline strip on the front of each frame is *visible* . . . listings may be added or changed without concern for label changing or other indexing detail. The expansion factor within each side of each frame is filled with blank Flexoline strips until each space is wanted for an actual listing.

Frames are aluminum and are removable. Non-skid corrugated rubber strips are mounted on the underside of the base, which is of "bridge" construction for straddling divider strips on switchboards. (When specified, flat base units will be supplied, with over-all corrugated rubber attached to bottom.) Flexoline strips are furnished in sheets of 42 strips per sheet, pre-scored horizontally to the ⅛" standard typewriter space. Supply of Flexoline is included to completely establish the reference listings and accommodate listing changes.

FOUR SIZES

7 frame units with 390 or 490 listings capacity
13 frame units with 712 or 890 listings capacity



Acme Visible Equipment has been designed for telephone use by Acme Systems Engineers in close cooperation with practical, experienced telephone experts. Tell us your requirements and receive our suggestions and quotations.

MAIL COUPON TODAY

ACME VISIBLE RECORDS, INC. Telephone System Division, Crozet, Virginia

T10-12-57

Please send us illustrated booklet

☐ #1088 on Acme Switchboard Keyshelf Units ☐ #975 on Acme Flexoline

☐ Have representative call. Date____ Time____

☐ We are interested in Acme Visible equipment for____ (KIND OF RECORD) records.

COMPANY____ ATTENTION____

ADDRESS____

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

CITY____ ZONE____ STATE____

who said it couldn't be done?

We remove spots every day! Those spots you get before your eyes from watching rising costs nudge upward toward revenue.

Our Complete Directory Service Plan is now operating successfully in 4400 communities . . . has proved its effectiveness by giving extra profits to independent telephone companies all over America.

Want to give *your* Directory a new and *better* look? We'll be glad to show you how. Just call or write our nearest office.

GENERAL SYSTEM

GENERAL TELEPHONE DIRECTORY COMPANY

1800 Busse Highway • DES PLAINES, ILLINOIS • VAnderbilt 4-2164

Divisional Sales Offices

COLUMBIA, Mo. • 811 Cherry Street • GIbson 2-6907
DURHAM, N.C. • 108 E. Parrish Street • Tel: 5133
ERIE, Penna. • G. Daniel Baldwin Building • Tel: 2-4187
FORT WAYNE 2, Ind. • 229 E. Berry Street • Eastbrook 3477
LEXINGTON, Kentucky • 157 Walnut Street • Tel: 4-7626
LONG BEACH 15, Calif. • 1775 Ximeno Ave. • HEmlock 3-7441
MADISON, Wisconsin • Tenney Building • ALpine 7-1667
SAN ANGELO, Texas • 110 South Taylor St. • Tel: 6738
SPOKANE, Wash. • 108 N. Washington St. • MAdison 4-4336
SPRINGFIELD, Ill. • Myers Bros. Building • Tel: 8-3425

OCT 22 1957